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ABSTRACT

This dissertation study attempted to identify factors related to the success of 27 resource teams charged with the implementation and diffusion of the USMES Program. Thirty-four factors, grouped into three clusters (demographic, Resource Team Workshop, and organizational), were selected for study. The data analysis indicates a number of variables are significantly related to the dependent variables and identifies ten independent variables as significant predictors. (MK)

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ED180748

THE RELATIONSHIP BETWEEN SELECTED CHARACTERISTICS OF REGIONAL USMES RESOURCE TEAMS TO DIFFERENCES IN LEVELS OF IMPLEMENTATION AND DIFFUSION OF THE USMES PROGRAM

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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A Dissertation

Presented to

the Graduate Faculty of

the Department of Curriculum and Instruction

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of the Requirements for the Degree

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by

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The University of Virginia

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ACCEPTANCE OF THE DISSERTATION

This dissertation is accepted by the Graduate Faculty of the Curry Memorial School of Education, University of Virginia, in partial fulfillment of the requirements for the Doctor of Education Degree.

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ABSTRACT

THE RELATIONSHIP BETWEEN SELECTED CHARACTERISTICS OF REGIONAL USMES RESOURCE TEAMS TO DIFFERENCES IN LEVELS OF IMPLEMENTATION AND DIFFUSION OF THE USMES PROGRAM

WHITE, Edwin Phillip, Ed.D.

University of Virginia, 1976

Chairperson: Dr. Ron Comfort

This study was an exploratory attempt to identify factors which were related to the success of twenty-seven (27) regionally-based Resource Teams. These teams, trained during a two-week Resource Team Workshop, sponsored by the Unified Science and Mathematics for Elementary Schools (USMES) Project were charged with implementation and diffusion of the USMES Program. Thirty-four factors, identified through a review of change and implementation literature, were selected for study. These factors were grouped into three clusters: demographic, Resource Team Workshop, and organizational. Two (2) measures of implementation (average hours/week USMES taught/Team and total number of USMES units taught/team) and one (1) measure of diffusion level (number of diffusion activities/team) were used as dependent variables.

Data were collected through three questionnaires to all team members (N=176), monthly team leader reports, observations during the Resource Team Workshop (July, 1975), and

reports from principals of participating elementary schools. Pearson product-moment correlations and stepwise multiple linear regression were used to analyze these data.

The findings from the Pearson product-moment procedure identified the following variable as being significantly related (p .10) to the dependent variables; number of college/university persons/team, number of institutions/team, number of schools/team, value of working on implementation plan, organizational health/team, number of limitations to implementations, role of team leader, size of team, number of school systems/team, Post-RTW-appeal of USMES, Post-RTW value of RTW, and value of team meeting at RTW.

The analysis of these data by stepwise multiple linear regression selected the following independent variables as significant predictors; size of team, Post-RTW appeal of USMES, April appeal of USMES, Post-RTW value of RTW, Post-RTW value of mini-workshops, Post-RTW value of working on USMES units, Post-RTW value of implementation plan, April value of team meetings at RTW, organization health of team, and limitations on implementation.

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My first note of thanks cannot be expressed to anyone except to my wife, Judi. To whatever degree my thoughts, actions, beliefs, and abilities are embodied in this document they are miniscule compared to the level of support, stimulation, and assistance she has provided me.

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The support and assistance of Jim Esposito, Judith Morris, and Ertle Thompson is also acknowledged not only for their efforts in relationship to this study but also to my professional development.

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A special note of thanks is extended to the staff of the USMES Project, Education Development Center who not only provided support and encouragement for this study but have also furnished stimulation for my own personal and professional growth. Thom Brown, Jim Corum and Earle Lomon are especially thanked in this regard.

The time and energy of Lynda Woody, who did most of the typing related to this study, has been invaluable and my sincerest thanks go to her.

FOR

Dubby, Pumpkin, and KiKi

Mom
Dad
Paul
Sim

Ron
Callie
Bruce
Lynda

Ed
Joe
Doc

Jim
Thom
Earle

Paul
Chuck

Patty, Marion, Carol

Bill
Dave
Skip

Judith
Larry
Dotti

and to all of those who have offered themselves so that I might be what I am.

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CHAPTER I

The educational institutions of today, although many appear to resemble their counterparts of a hundred or more years ago, are in many ways placing increasingly high value on change and innovations. To some, it is an attempt to consciously improve whatever they wish to do; for others, it is only a superficial covering as a symbol of quality. For those concerned with real and lasting change efforts, their attempts are saturated with frustration and mystery. Why do changes not endure and innovations peak, then slowly begin to disappear, so that the situation reverts to the point of departure?

Perhaps it is inherent in the human condition to resist change. If so, how did we get to where we are now, regardless of its perceived value? It would appear that change is possible. How can we understand the change process? What strategies of change are available? What factors are important in instituting change and then stabilizing the innovation? One might predict that the future lies in our understanding of change. If this is so it would seem valuable to gain a better understanding of the processes of change, whereby such an understanding could be utilized to create and implement planned, rational changes.

One such area of potential study could involve the

implementation of a new educational innovation. What are the various strategies that could be used to introduce a desired change and within any particular strategy, the idea of examining possible sources of influences within one specific implementation strategy seems to provide the means to answer some of the questions previously stated.

Problem Statement

This study proposes to examine the relationship between selected characteristics of regionally-based educational change teams to the subsequent differences in the levels of program implementation and amount of diffusion activities engaged in, during 1975-76, of the Unified Sciences and Mathematics in Elementary Schools (USMES) program. Essentially, each USMES Resource Team is charged with two major tasks: (1) implementation of the USMES program within participating team members' schools (2) diffusing information about, and providing trainers for, the USMES program to educational organizations and personnel on a regional basis.
It was the intention of this research to document apparent variations of selected Resource Team characteristics and to identify which characteristics have the greatest tendency to account for differences among team's levels of attainment of the two tasks identified above. The USMES Resource Teams vary in size, number of institutions represented, types of institutions, number of individual schools, types and numbers of educational roles, and amount of local commitment

to USMES.

In 1974, the Unified Sciences and Mathematics for Elementary Schools (USMES) Project located at the Education Development Center (EDC), was funded by the National Science Foundation (NSF) to conduct a Resource Team Workshop (RTW) for implementation and diffusion of the USMES program. The strategy chosen as a vehicle for the goals of implementation and diffusion was the development of regionally-based (involving more than one school district or institution) USMES Resource Teams. Prior to this, USMES and other implementation and diffusion programs had either utilized the individual teacher training approach or resource teams from a single school district. A major consideration in the submission of this proposal to NSF by USMES was to develop a different model of change strategy for possible use by various organizations and institutions after the developmental funding to the USMES Project ceases in 1977.

Earle Lomon, USMES Project Director, describes the Resource Team concept in an Interim Report to NSF in the following manner:

> This year's USMES Resource Team program is directed at forming regional self-sustaining and growing collaborations of district Resource Teams and coordinating educational institutions. In this model, the school district administration and Resource Team members share responsibility with the intermediate agency for collaborating with each, both for internal implementation and for dissemination throughout the region. The intermediate agency provides liaison, instructional and

> curriculum specialists while the districts supply resource people with experience in USMES utilization, and visible models of USMES classes and administrative support at the school and district level.[1]

Thus, while USMES is concerned with the strategy of regionally based Resource Teams in regard to successful implementation and diffusion of the USMES program, this study seeks to utilize an opportunity to explore the relationship between various characteristics of the Regional Resource Teams to the subsequent levels of implementation and rates of diffusion. Twenty-seven Regional Resource Teams, involving one hundred and seventy-six people from eighteen different states were involved in this study.

Problem Choice

Change Literature. Historically, the literature available on change has mainly been limited to the theory building level. What limited movements into the field of studying change strategies have been reported have not generally occured in the area of educational innovations but consistently have been found in reports of sociological and industrial research.

There have been two major attempts to provide a theoretical base for educational change and to design a taxonomic framework from which to identify and select change

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[1] USMES Project, Interim Report: 1975 Regional Resource Team Program (Newton, MA: USMES, 1975), NSF Grant No. PES 75-02165, p. 1.

tactics. Bennis, Benne, and Chin in 1961 and in a revised edition released in 1969, describe three general orientations for instituting change:

1. Rational - Empirical
2. Normative - Re-educative
3. Power - Coercive[2]

In the Change Agents' Guide to Innovation in Education Havelock, after a five year, 4,000 item review of the change related literature, proposes a second set of general orientations toward change composed of the following categories:

1. Research, Development and Diffusion (RD&D)
2. Social Interaction (S-I)
3. Problem - Solving (P-S)[3]

Despite this very necessary and valuable theoretical base on change processes, very little is being done to apply these strategies to real practical situations and to find out what works under what conditions. Mahan, in summarizing several years of work with the Eastern Regional Institute for Education (ERIE), concludes that:

> Educators willing to invest time and energy in curriculum change should work directly with schools instead of writing about school shortcomings and what schools should do. Perhaps the rational-empirical,

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[2]Warren G. Bennis, Kenneth D. Benne, and Robert Chin, The Planning of Change (2nd edition; New York: Holt, Rinehart, Winston, 1969), pp. 32-59.

[3]Ronald Havelock, The Change Agents' Guide to Innovation in Education, (Englewood Cliffs, NJ: Educational Technology Publications, 1973), pp. 153-168.

> power-coercive, and normative-re-educative, and knowledge linking change positions in the literature today outnumber the large, really effective, "in operation everyday", curricular change undertakings. It is time to move change prescriptions from their conceptual state into a chronological sequence of task oriented activities culuminating in local district financial support of emergent curricula.[4]

Thus, Mahan, and later Chin[5], seem to be stating a real need for educators to test out the various change processes and to identify the characteristics which have shown the greatest potential for wide spread utilization. A study of one change strategy, Regional Resource Teams, seems to be the type of research needed if one accepts the criticism of Mahan and Chin. Heather continues this line of thought, when, in preparing a list of recommendations of needed research in educational change, he identifies; "emphasis on the process of implementing the programs as a key area of future study."[6]

Hoyle, in Problems of Curriculum Innovation, argues that curriculum developers have tended to concentrate on the process of RD & D, neglecting the equally important process

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[4] James Mahan, "Overview of a Systematic Effort to Engineer and Monitor Curriculum Change: Emerging Guidelines and Encouraging Findings for Curriculum Installers." (Paper presented at AERA 55th Annual Meeting, New York, NY, February 4-7, 1971), p. 17, ERIC 047 367.

[5] Robert Chin, "Applied Behavioral Science and Innovation, Diffusion and Adoption" in Viewpoints Vol. 50, 3 (1974), pp. 25-45.

[6] Glen Heathers, Planned Educational Change in Search of a Research Tradition (Philadelphia: Research for Better Schools, 1974), p. 16, ERIC 108 303.

of implementation.[7] Clearly, prior research in educational change has tended to be theoretical in nature and a definite need exists to move into the area of specific change strategies, such as this study proposes to do.

Limited Concern for Implementation Strategies. In the early 1950's there developed a growing national concern that our schools were not adequate and that changes were needed, particularly in the areas of science and mathematics. The National Science Foundation responded to this need with an improvement program designed to upgrade knowledge of science and mathematics. At first, these attempts were directed at college level teachers, but slowly NSF began to provide support for similar programs in secondary science and math. Almost from the inception of these institutes for improving the quality of science and math instruction there was criticism of the program design.

Dr. Eugene Northrop commented on the first NSF Summer Institute (secondary teachers) after spending two years as a consultant to NSF on the development of the institute program.

> Most proposals for improving undergraduate and graduate programs for the preparation of science teachers - especially secondary school teachers - have in common one shortcoming. They assume that if the required number of courses in science is increased

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[7]Eric Hoyle and Robert Bell, Problems of Curriculum Innovation I (England: The Open University Press, 1972), p. 81.

> then better science teachers will result. This amounts to assuming that two kidney plasters are better than one without inquiring whether kidney plasters are good for kidney ailments . . .[8]

Fourteen years later, Walberg and Rothman, in researching the relationship between achievement in college course work and student learning comment that:

> . . .researchers noted that NSF had spent over $100 million in teacher institutes during the 1960's under the questionable assumption that by upgrading teachers' achievement in subject matter, more effective teaching and learning will result.[9]

In addition to initiating change through summer subject matter institutes, NSF, in 1957, began to provide funds for the development of new science and math elementary and secondary programs. Although these improvements have had a definite and lasting effect in pockets of the educational system, there remains much doubt as to their widespread impact. In describing past efforts, Hurd writes that:

> In the decade between 1960-1970 the government of the United States contributed nearly one billion dollars to develop new curricula in the sciences and to train teachers to use them properly. The diffusion and implementation of these programs in schools has not met expectations.[10]

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[8]Eugene P. Northrop, Reflections on Education in the Sciences cited in An Investment in Knowledge, Krieghbaum and Rawson (New York: New York University Press, 1969), p. 154.

[9]Herbert J. Walberg and Arthur Rothman, "Teacher Achievement and Student Learning", Science Education, Vol 53 (April, 1969), pp. 256-257.

[10]Paul D. Hurd, "The Diffusion and Implementation of Science Curricula: A Planning and Developmental Proposal" (unpublished paper, Biological Sciences Curriculum Study, University of Colorado, 1972), p. 1.

In reviewing the research literature in NSF and other organizations that have supported similar programs (NDEA, Ford Foundations), Hendren concludes that: "Despite the millions of dollars used to support such programs, relatively few formal studies have been conducted to determine the effectiveness of institutes and similar NSF programs. . ."[11] This same perspective is supported by Highwood and Mertens when they concluded that: "Although all of the programs (NSF Institutes) have received wide acceptance by universities and participants alike, the effectiveness of the programs in fulfilling their intended objectives has not been substantiated."[12] Cirrincine in evaluating implementation efforts in the area of social studies, reaches essentially the same position when he summarizes past efforts to integrate newly developed program into the educational system:

> In terms of many of the national curriculum projects, it is becoming more and more evident that the utilization of the materials has not been as extensive as projected; the dissimination and implementation of these materials have been limited.[13]

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[11]Julianne Hendren, "A Study of an NSF Institute," American Biology Teacher, Vol 35-9 (December, 1973), p. 510.

[12]Joyce E. Highwood and Thomas R. Mertens, "Evaluations of NSF Summer Institutes," American Biology Teacher, Vol 34-4 (April, 1972), p. 216.

[13]Joseph M. Cirrincine, "A Teacher-Oriented Strategy for Implementing the High School Geography Project," Indiana Social Studies Quarterly, Vol 27-1 (1974), p. 34.

In characterizing the 138 citations used in the preparation of, Research Paper #16 - Impact of the National Science Foundation Teacher Institute Program, Helgeson made the following remark.

> Much of the research was of a descriptive nature dealing with characteristics of the institute participants, their attitudes, various aspects of the programs or changes in teaching behavior perceived by students, principals, or the teachers themselves.[14]

It is of primary importance to this researcher that not one of the references noted, relates to research on the strategy utilized to actually implement the program or changes desired. Clearly we have not previously attended to the medium through which our messages are being conveyed. In the Report of the Science Curriculum Review Team (NSF) the committee clearly states the need for expanded research in the area of curriculum implementation.

> Studies focused in implementation issues such as the persistence of innovations, analysis of the cost-effectiveness of different implementation approaches, etc. should be pursued. Baseline data on current usage of materials, the impact of our implementation strategy, and assessment of different implementation models are needed.[15]

Emphasis on Changing Individuals. The first fifteen years (1953-1968) of federal intervention saw enormous amounts of monies funneled into programs designed to improve

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[14]Stanley L. Helgeson, "Impact of the NSF Teacher Institute Program," Research Paper No. 16, (Columbus, Ohio: The Ohio State University, 1974), p. 2.

[15]National Science Foundation, Pre-College Science Curriculum Activities of the National Science Foundation, Report of the Science Curriculum Review Team (Washington, D.C.: National Science Foundation, 1975) Volume II - Appendix, p. 66.

education, either directly by the development of new programs or indirectly through attempts to upgrade the teaching ability of teachers. All of these efforts were based on one common model of change, the rational-empirical orientation described by Bennis, Benne,[16] and Chin or the RD & D strategy by Havelock.[17] Basically both of these change strategies were based on extensive efforts in the agriculture field and county extension agents. It was found moderately successful, that if you provided sufficient logical reasons why a farmer should adopt a new technique or idea and would show visible evidence (demonstration plot) of the superiority of this innovation, it would be and generally was rapidly accepted.

The application of this approach to our complex and multi-faceted schools or in the solution of our social problems was not successful. Etzioni cites change efforts toward smoking, drinking while driving, and drug abuse as examples of the overwhelming failure of this strategy. He clearly sees a need to move away from focusing change efforts on the individual and toward changing the environment that supports/discourages specific behavioral patterns.

> The prevalent approach in the treatment of our numerous and still-multiplying social problems is the first (rational-empirical orientation). Imbedded in the programs of federal, state, and city governments and embraced by many citizens,

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[16]Warren G. Bennis, op. cit.

[17]Ronald Havelock, op. cit.

> especially liberal ones, is the assumption that, if you go out there and get the message across-persuade, propagandize, explain, campaign--people will change. . .[18]

Katz and Kahn reflect that historically the way in education to institute change has been to place emphasis on individuals with the assumption that since the organization is composed of individuals, by changing them we change the organization. This approach, is obviously insufficient by itself, when they state:

> Its (concentrating on changing the individual) essential weakness is the psychological fallacy of concentrating upon individuals without regard to the role relationships that constitute the social system of which they are a part.[19]

Krieghbaum and Rawson in relating the first ten years of efforts at change through NSF institutes, conclude in their summary of the perceived impact of these institutes:

> . . .there is a widespread feeling among those connected with the institute programs that if only one teacher in a school has been to an institute he may well be ignored, if there are two, they will be listened to; and if there are three or four things will start happening in that school.[20]

Previous RTW Studies. Porter, after reviewing evaluative data on NSF and NDEA summer institute and Resource

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[18]Amitai Etzioni, "Human Beings Are Not Very Easy to Change After All," Saturday Review, (June 3, 1972), p. 45.

[19]Daniel Katz and Robert Kahn, The Social Psychology of Organizations, (New York: New York University Press, 1969), p. 391.

[20]Hiller Krieghbaum and Hugh Rawson, An Investment in Knowledge, (New York: New York University Press, 1969), p. 312.

Personnel Workshops (RPW) adds emphasis to the rejection of change strategies that focus on the individual solely.

> I believe that the difficulty with the early workshops was in their perspective on change and in their conception of schools. They have taken a micro-approach to change. Specifically they have tried to change organizations by changing individuals only, and they have ignored the complex realities of these organizations as dynamic political systems. The early workshops have had as their focus, the individual teacher in a single school. They have tried to influence the teacher by giving him new information about his subject matter with the implicit expectation that this would improve the educational system. It assumes that the individual can be provided with some new insights, that these will change his behavior, that they will be retained when he leaves the protected situation in which he learned them, that he will be able to adapt his new knowledge to the real world, that co-workers will accept his changed behavior, and that they will be able to make complimentary changes in their own behavior. These assumptions have been shown to be unwarranted by the evaluation of the summer institutes.[21]

Rowe, in 1971, conducted a follow-up study of a 1968 NSF institute, of which she was Project Director, designed to train ten scientist-science education teams. The ten teams (30 people) reported that as a result of their collective efforts; 35,575 children were currently using the programs in which the teams had been trained, 6 out of 10 teams had incorporated the intent of these programs into their liberal arts (non-major) science courses, 7 out of 10 had incorporated the new programs into methods courses. Additionally 11 NSF

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[21] Patricia Porter, "Evaluating A Resource Personnel Workshop: A Team Leadership Approach" (unpublished Doctor's dissertation, Stanford University, 1974), p. 21-22.

grants for curricula implementation were received when none had been received prior to their participation in the institute. Rowe summarizes her findings and concludes that: "Attempts at producing durable innovations back home must scuttle the individual as the target and medium of change in favor of creating teams with multiple resources."[22]

Schlechty found in examining his own institutes that teachers, upon returning home, attempt to implement their new ideas but soon succumb to the pressure of the system to return to their prior institute behavior. Schlechty offers the reason that, no planned attempt was made to force the system to adjust to the new style of teaching learned by the institute participant, and that before real change will occur that the system to which a teacher returns must be taken into account.[23] Baldridge agrees with this point-of-view and lists as a major oversight of current change strategies, sufficient concern for organizational influences.[24]

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[22]Mary Budd Rowe, "The Fate of Ten Scientist-Science Educator Teams Three Years After Participation in a Leadership Training Pro-ram" (Unpublished paper, Columbia University, 1971), ERIC 052941, p. 5.

[23]Phillip C. Schlechty, "Organizing for Change" Tarheel Social Studies Bulletin, Vol. 18-1 (1970), p. 16.

[24]J. Victor Baldridge, "The Impact of Individuals, Organizational Structure, and Environment on Organizational Innovation," Research and Development Memorandum No. 124, Center for Research and Development in Teaching (Stanford University, 1974), ERIC 091856, p. 13.

Merkle[25], Brubaker[26], and Porter[27] provide additional support for this perspective.

This gradually developing view, that change strategies which emphasized changing the individual teacher, without concern for the organization in which the change was to be implemented, generated a search for potentially more effective implementation strategies. Combined with this, was a general trend on the part of funding agencies to begin to plan instructional and curricula changes for the previously uninvolved elementary schools and teachers. The sheer number of teachers involved (1,100,000) indicated that additional problems were forthcoming, since it would be impossible to expect that a significant percentage of these teachers could attend a summer institute.[28]

Thus, partially as a result of these concerns, in 1967, NSF supported several institutes whose purpose it was to examine various ways in which new instructional materials

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[25] Dale G. Merkle, "A Leadership Workshop on Elementary School Science: An Indepth Evaluation," Journal of Research in Science Teaching, Vol. 7-2 (1970), p. 121.

[26] Dale L. Brubaker and Roland H. Nelson, Jr. "Pitfalls in the Educational Change Process," Journal of Teacher Education, Vol. 26-1 (1975), pp. 65-66.

[27] Patricia Porter, op. cit., p. 267.

[28] Hiller Krieghbaum, op. cit., p. 326.

could be effectively and efficiently diffused and used. One of the models which evolved out of these workshops employed the team concept. This idea grew out of the realization that effective change in a system as large and organizationally complex as many school systems today needed the combined efforts of a number of persons.[29] Beginning in 1967 through 1973, NSF provided $7,080,081 for the support of RPW's and RTW's totalling 151 workshops and 5,499 participants.[30] Although there is substantial evidence to support the transition from emphasizing individuals to a team notion, as potentially capable of more effectively influencing the organization in which the change is to take place, little information is available on how the variations among resource teams account for success. Porter, Rowe, Schlechty, Merkle, Sweetser, Juicich, Girault and Gross and Hering all attempted through a case study methodology to provide a rationale supportive of this approach. This study attempts to move beyond the very necessary, but limited case study research design, to one that provides specific data analysis among teams involved in implementation and diffusion.

In identifying the reasons supporting the selection

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[29]George Juicich, "The RPW As a High School Geography Project Diffusion Mechanism," Indiana Social Studies Quarterly, Vol. 27-1, (1974), p. 24.

[30]National Science Foundation, Pre-College Science Curriculum Activities of the National Science Foundation: Report of the Science Curriculum Review Team, (Washington, D. C.: National Science Foundation, 1975), p. 26.

of this particular problem for study, the following summary appears legitimate:

1. most literature on change processes is theoretical in nature

2. more emphasis has been placed on researching adoption variables with relatively little emphasis in implementation strategies

3. enormous amounts of monies have been spent on developing and installing new program with little or no research to indicate widespread diffusion or implementation

4. prior change strategies have focused on the individual without concern for organizational influence

5. prior research on resource teams has been limited to case study formats indicating potential variables for inclusion in this study.

Scope and Sequence of the Problem: Description of the USMES Resource Team Program. The 1975-76 USMES Resource Team Workshop, although similar in many respects to previous USMES RTW's and other curriculum projects' RTW's, did incorporate additional aims. Typically the intent of an RTW is to train school personnel in utilization, implementation strategies, and diffusion techniques for use in a single school system. Although the teams may come from all over the United States, historically all members of a Resource Team are associated with the same school district and possibly a professor from a nearby college/university. Each district

Resource Team is generally composed of teachers, principals, and central office personnel although the number of persons representing each role will vary in relation to the specific situation. In 1974, USMES held two Resource Team Workshops (Arlington, MA - April 15-21; Santa Cruz, CA - June 24 - July 5), at which a total of 35 district Resource Teams composed of teams whose members all came from the same school system, and were labeled district Resource Teams.[31,32]

As noted previously, "this year's (1975-76) USMES Resource Team program is directed at forming regional, self-sustaining, and growing collaborations of district teams and coordinating educational institutions,"[33] Each team is generally composed of personnel from two or more individual school systems plus additional persons from intermediate agencies, such as; regional inservice education center, state department of education, a college/university. Prior, district USMES Resource Teams were obligated only to implement and diffuse USMES within the specific school system

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[31] USMES Project, Report of the USMES Resource Team Workshop: Arlington, MA, (Newton, MA: USMES, 1975), p. 1.

[32] USMES Project, Report of the USMES Resource Team Workshop: Santa Cruz, CA, (Newton, MA: USMES, 1975), p. 1.

[33] USMES Project, Interim Report: 1975 Regional Resource Team Program, (Newton, MA: USMES, 1975), p. 1.

they represented. Diffusion activities outside the school system represented on the team was encouraged, but not, expected or required by the USMES Project. The Regional Resource Teams, trained in 1975, are expected not only to implement the USMES program within schools represented on the team but are committed to diffusion activities both within the school systems they represent and to other school systems in the surrounding geographical region.[34] Included in most of these Resource Teams will be college/university personnel who are to function not only as a liason and facilitator to each of the school systems within a Resource Team, but also to incorporate the USMES program into the pre-service and in-service courses of the institutions they represent.

In August, 1974, after USMES had received approval from NSF to proceed with the planning of the 1975-76 Resource Team Workshop, staff members began to engage personnel from potential team sites in discussion and plans necessary for the formation of a Regional Resource Team. Possible team sites were based on feedback from people who had attended previous USMES Informational Workshops or personnel who sought out assistance in implementing USMES from the Project staff. Generally, these informal planning sessions were held with college/university, state department of education,

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[34]USMES Project, USMES Resource Team Program Brochure, (Newton, MA: USMES, 1975), p. 1.

or central office personnel who provided the impetus for the eventual formation of a Resource Team. However, in at least one case, a classroom teacher was the central figure in the collaboration of two school systems, a university and a state department of education in the forming of a team. A formal announcement of the USMES Resource Team Program was made in December of 1974 with brochures detailing the conditions necessary for consideration to over 3,000 school systems and institutions throughout the United States. (Appendix A) In addition, four professional educational journals carried a condensed version of the brochure to increase exposure to potential applicants. Approximately 200 separate requests for more information were received as a result of these announcements.[35]

As a result of these announcements 47 team applications were received by USMES and 29 of the teams, ". . . representing the strongest collaborations among groups that could diffuse and implement USMES in a region consisting of several school districts (or a very large district) over a period of time were identified. These teams were invited to send representatives to one of two pre-workshop planning conferences held at EDC (Newton, MA) during the spring

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[35] Earle Lomon, Director's Report (Interim) on the 1975 USMES Regional Resource Team Workshop, (Newton, MA: 1975), Grant No. PES 75-02165, p. 1.

of 1975."[36]

The two pre-workshop planning conferences, held in Newton, MA February 26-28 and April 30 - May 2, ". . .provided the team representatives opportunities to learn about and discuss the USMES style of teaching and learning, USMES resource materials, and USMES project activities, particularly the regional resource team program."[37] As a result of these conferences 25 of the 29 team representatives which attended, were able to secure the necessary commitments from school districts and educational institutions for regional diffusion and implementation of USMES. Three additional teams were formed, which did not attend the pre-workshop conferences, but through direct communications with the USMES Project staff, prepared strong team proposals.[38]

Twenty-eight Regional Resource Teams were selected to attend the USMES Resource Team Workshop held at Washington University (St. Louis), June 30 - July 11, 1975. The names of these regional teams are as follows:

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36 USMES Project, Interim Report: 1975 Regional Resource Team Program, (Newton, MA: USMES, 1975) p. 2.

37 Ibid, p. 3.

38 Ibid., p. 4.

Davis/San Juan, California
Los Angeles, California
San Jose, California

Colorado
Miami, Florida
Atlanta, Georgia
Northern, Illinois
Southeastern, Louisiana
Maine
Southern, Mississippi
Nevada
Brooklyn, New York
Staten Island, New York
Buffalo-Erie County, New York
Long Island, New York
Northern, New York
Putnam/Northern Westchester, New York

Philadelphia, Penn.*
Southern Oregon
Rhode Island
Austin, Texas
Utah
Houston, Texas
Blue Ridge, Virginia
Eastern, Virginia
Vermont
Washington
Wisconsin[39]

*Did not complete RTW training and subsequently dropped from the Project.[40]

The purpose of the workshop was to familiarize participants with the USMES style of teaching and learning, the available units and resources and dissemination and implementation strategies. The major workshop activities included unit group meetings, team meetings, team-run miniworkshops, special topic meetings, and plenary sessions.[41] (See Appendix B)

> During the workshop each team member will spend a substantial amount of time in "learning by doing", including "hands-on" work on two different unit challenges. In addition to working on the two challenges at an adult level, with Design Lab work and special skill sessions as needed, each participant will work on the challenges with children on several

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[39] Earle Lomon, op. cit., (Participant Roster)

[40] Ibid., p. 6.

[41] Ibid., p. 1.

different occasions. During the second week of the workshop each Resource Team will send a representative to special Design Lab Coordinators training sessions conducted by the USMES Design Lab staff. Time will also be provided for discussions of other aspects of the USMES project.

During the workshop each team will develop its own dissemination/implementation plan and will conduct one or two "mini-workshops" for the other workshop participants."[42]

A major concern of the workshop, since most Resource Teams are composed of personnel from several school districts or other organizations who are not well known to each other, is the development of a team cohesiveness. Throughout the two-week workshop the USMES staff and consultants provided provide activities and opportunities for each team to develop into an individual working unit. It was believed, from experience with previous USMES RTW's by the USMES staff that effective team building experience will provide a better result (diffusion and implementation of USMES) in the end. The following are examples of strategies used to foster the development of each Resource Team as a coherent and functional organizational unit; requiring a full team meeting prior to the RTW, arranging itineraries so that each team travels to and from the RTW together, daily team meetings, assigning an USMES staff member to each team, fostering social events during the RTW, developing a team

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[42] USMES Project, USMES Resource Team Program Brochure, (Newton, MA: USMES, 1975), p. 5.

plan for diffusion and implementation, and production of two-miniworkshops.[43, 44] A detailed review of the literature in chapter two of this study cited evidence to support concern for this perspective.

In addition to the training that Resource Teams receive at the RTW, the USMES staff provided the following, as mechanisms to enhance the effectiveness of team's ability to diffuse and implement the USMES program: distribute the USMES Newsletter and Resource Team Bulletin to all team members, supply a complete USMES Library and slide-tape show, visitations from USMES Central staff, staff for inservice activities, subsistence and travel for one representative of the Resource Team to attend an USMES regional and national convention, and funds to partially defray the expenses involved in holding USMES Informational and Workshops.[45,46,47] In response to the training

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[43]USMES Central Staff, The USMES Systems Approach to Development, Widespread Implementation, and Maintenance of a Real Problem Solving Program in Elementary Schools, (Newton, MA: USMES, 1974), pp. 42-48.

[44]Earl Lomon, 1975 USMES RTW Proposal to NSF: Abstract, (Newton, MA: USMES, 1974), Grant No. PES 75-02165, pp. 16-20.

[45]USMES Project, USMES Resource Team Program Brochure, op. cit., pp. 4-5.

[46]USMES Project, Bulletin for USMES Resource People, (Newton, MA: USMES), January, 1976: Vol 3, p. 1.

[47]USMES Project, 1975 Resource Team Program - Memorandum of Understanding, (Newton, MA: USMES, 1975), p. 1.

experienced at the RTW and from the continuing support provided by the USMES Project, described above, each team agreed to the following:

1) to meet regularly with the members of their Resource Team

2) to assist in carrying out the implementation plan developed at the RTW (or subsequent modifications)

3) to complete reports on classroom utilization, diffusion, and implementation activities

4) to utilize USMES in their classes

5) not to engage in practices that discriminate against, on the grounds of sex, race, creed, color, or natural orgin when carrying out the activities of the Resource Team Program.[48,49]

Table 1 provides a brief overview of the activities and timeframe for the 1975 USMES Regional Resource Team Program.

Descriptive Information on USMES Resource Teams

The 27 Regional USMES Resource Teams are composed of 176 people representing a wide variety of roles and organizations. One hundred and eighteen of the team members are classroom teachers (67%), 31 are administrators/ supervisors (18%), 21 are from college/universities (11%), and six are from state departments of education (4%). The

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[48] Ibid., p. 2.

[49] USMES Project, USMES Resource Team Program Brochure, op. cit., pp. 3-5.

Table 1

1975 USMES Regional Resource Team Program

August, 1974 - Announcement of grant to USMES/EDC by NSF

August-December, 1974 - Informal development of Regional Resource Teams

December, 1974 - Formal announcement (brochure) of Resource Team Program

December, 1974 - June, 1975 - Formal negotiations with organizations proposing USMES Resource Teams

February - May, 1975 - Pre-Workshop Planning Conferences (Newton, MA) Selection of Resource Teams

July, 1975 - Resource Team Workshop (Washington University - St. Louis)

August, 1975 to June, 1976 - Implementation and Diffusion of USMES by Resource Teams

December, 1975 to February, 1976 - Regional Resource Team Conferences

number of school districts included in each team varies from two to six with a mean of 2.1. All except five of the teams are associated with a college or university. Also five teams have team members from their respective state departments of education. The size of the teams attending the RTW varies from two to eleven with the mean size of 6.6. All teams have at least two different roles (teacher, principal, supervisor) represented on their team with a maximum of six roles and a mean of 4.3 for all 27 teams. Sixteen of the team leaders are college/university faculty and 11 are from local school system roles, only one of the team leaders is a classroom teacher. The 27 teams are located in 18 states. States having more than one team are; California (3 teams), New York (5 teams), Virginia (2 teams) and Texas (2 teams). Figure 1 indicates the approximate location of the 27 USMES Resource Teams trained in 1975.

Figure 1

Location of 1975-76 Regional USMES Resource Teams

Selection and Organization of Variables. The selection and subsequent classification of variables to be studied in this investigation are derived from an extensive review of the literature, reported in detail in Chapter 2. The major areas from which the accompanying literature search, which resulted in identification of potential variables for study, is drawn, include: general change strategies; social-psychological view of change and organizations; organizational development practices; previous NSF summer institutes, RPW's and RTW's, change agent literature; NSF proposals and Interim Reports; and general systems theory.

It was found by this investigator that by grouping the resulting variables to be studied into three clusters, an effective conceptual design could be presented. Some variables, by their very nature, have been listed in more than one cluster. The three clusters of variables are:

1. Variables describing demographic aspects of the teams.
2. Variables describing the team's acceptance of the USMES Program and the RTW.
3. Variables describing the organizational influences on or within the teams.

Data in the variables was collected through the following procedures: self-report questionnaires from team members and leaders, monthly team reports, teacher logs, letters of commitment and implementation/diffusion plans submitted to USMES staff by Resource Teams.

Demographic Variables

Size of team at RTW
Number of school systems represented on a team
Ratio of teachers to non-teachers on each team
Number of schools on each team
Number of roles represented on each team
Number of college/university personnel on each team
Number of institutions represented on each team
Number of teachers on each team

Resource Team Workshop Variables

Appeal of the USMES program (Pre-Post RTW)
Ranking of mini-workshops at RTW
Ranking of Resource Team Workshop (RTW)
Satisfaction of team composition (Pre-Post)
Unit work on USMES challenges at RTW
Work on implementation/diffusion plan at RTW
Team meetings at RTW

Organizational Variables

Number of team meetings held prior to attending RTW
Commitment letters to USMES by teams
Amount of school system support
Organizational health of team
Perceived team authority to implement USMES
Rating of implementation plans developed at RTW
Perceived instructional activity: actual vs. ideal
Team meetings at RTW
Work on implementation/diffusion plan at RTW
Number of different roles on each team
Number of team meetings held during year

The dependent variables, (a) levels of implementation and (b) rate of diffusion activities engaged in, will be determined by the following criteria:

IMPLEMENTATION CRITERIA

The criteria for assessing level of implementation of any innovation is difficult at best. One is immediately confronted with the question of whether to measure quality or

quantity. The only true quality measure of implementation would have to address the question; "Are the students better problem-solvers than they were before USMES was implemented." No practical means presently exists to assess this type of achievement. USMES has developed two tests, designed to measure problem-solving skills, but these tests can only be used with three to four students at a time and requires about one hour. Although superior, another criterion of establishing level of implementation rather than quality of student achievement must be utilized.

1. The average number of hours per week USMES is taught by members of a team
2. The total number of USMES units taught in schools which are part of an USMES Resource Team.[50]

DIFFUSION CRITERIA

The criteria for level of diffusion by a Resource Team will be quantity measures of the number of diffusion activities engaged in, utilizing the following categories.

a. Number of informational meetings (exposure)
b. Number of workshops (training)
c. Amount of publicity (articles, news releases)
d. Number of times USMES was included in pre-service and in-service courses through participating colleges/universities

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[50] Earle Lomon, 1975 USMES RTW Proposal to NSF: Abstract, op. cit, pp. 7-13.

The collection of data for these variables was done in the same manner as for the independent variables. Analysis of data will rely on correlations and stepwise multiple linear regression.

Design of the Study

The initial impetus for this study was conceived, in its simplest form, after the investigator was a participant at a conference, sponsored by the USMES Project, to explore possible barriers and subsequent solutions to widespread implementation and diffusion of the USMES program.[51] Within the activities of this conference several of the participants attempted to define potential barriers and identify possible solutions. At first, the notion of researching "temporary systems" was considered but this was discarded because of the complexity of the topic itself and the lack of available data with which to make comparisons.

As the USMES staff was able to develop its concept of regional resource teams, it became apparent that variations between teams would be a crucial factor in their success. A long gestation period followed, with periodic intensive discussion about the problem between the investigator, USMES staff members, and members of the investigator's

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[51] USMES Project, Notes From USMES Three-Day College/University Meeting, (Newton, MA: USMES, 1974).

research committee. The product of this twelve to sixteen month exploration are seen in the following design. It was also of value to the conceptualization of this design that the investigator was directly connected with the formation of two Resource Teams and indirectly related to the development of a third. This experience provided unusual insight on the part of the investigator into the often invisible and valuable aspects of the entire regionally-based USMES Resource Team program.

Since both dependent and independent variables for this study have been identified previously in this chapter, it remains now to describe how and when data was collected and the method of analysis to be proposed. Some data, generally descriptive in nature, such as number of members on each team, number of different roles on each team, and number of teachers on each team was provided directly from the records of the USMES Project. Also included in the data supplied by USMES were team letters of commitment to USMES, implementation/diffusion plans submitted to USMES by teams, team reports, teacher logs, and implementation activity reports.

The first direct data collection from participants occurred during the opening session of the RTW at St. Louis. This questionnaire provided additional descriptive data on each team, how the USMES program appeals to members of teams, and questions designed to reveal information about

how satisfied teams are with their perceived authority to implement USMES and satisfaction with other members of their team. Some information was collected in this questionnaire for USMES Central staff and is not part of this study. This was done to avoid asking participants for information several times within a short time period. (Appendix C)

This second collection of data was immediately following completion of the RTW. This questionnaire supplied post-RTW information on appeal of the USMES program, perceived authority to implement/diffuse USMES, satisfaction with team members, and a rating by team members of the perceived value of the RTW. Although procedurally it would have been best to collect this data on the last day of the RTW, this was not done so as to avoid conflict with data collection activities of the USMES Project staff. The second questionnaire was mailed directly to all of the RTW participants two weeks after the workshop ended. (Appendix D)

The third and final collection of data was occurred in April (1976) through a series of questionnaires and report forms mailed to all RTW participants. These questionnaires provided information on appeal of USMES, rating of the RTW, organizational health, perceived limitations on implementation of USMES, frequency of instructional activities, and dissemination activities. Some information

was supplied directly by USMES, and therefore did not require inclusion in the final questionnaire. (Appendix E)

Data on the dependent variables, implementation/diffusion, was collected through a questionnaire to each team leader and participating school principal. As stated previously, some data was supplied directly from USMES via team reports, teachers logs, and implementation activity reports. (Appendix F)

The rating of each team's (1) letter of commitment to USMES and (2) implementation/diffusion plan was done after the RTW. Each of these variables was analyzed by comparing the statements made by each team to the guidelines issued by the USMES Project. In collaboration with the USMES staff, a rating form was developed on each of these variables based on the original guidelines issued.[52,53] The rating forms developed are found in Appendices G and H.

Table 2 presents an overview of the projected time line for data collection, including the means for collection and source from which it was drawn.

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[52]USMES Project, USMES Resource Team Program Brochure, op. cit., pp. 3-4.

[53]USMES Project, Guidelines for Report Writing at USMES Regional RTW, (Newton, MA: USMES, 1975), p. 1.

Table 2

DATA COLLECTION TIME LINE

Pre-RTW (June 30, 1975)	Descriptive Information Appeal of USMES Letter of commitment to USMES	Questionnaire	All RTW participants
		Rating Form	Letters of Commitment sent to USMES/EDC
Post-RTW (August, 1975)	Appeal of USMES Rating of RTW	Questionnaire	All RTW participants
	Implementation Plan	Rating Form	Implementation Plans via USMES/EDC
April, 1976	Appeal of USMES Limitations Organizational Health Instructional activities	Questionnaire	All RTW participants
	Implementation & Diffusion activities	Questionnaire and Rating Forms	Team Leaders Principals USMES teachers

Design of the Study

This study attempted to assess the relationship between selected team characteristics to the dependent variables of levels of implementation of the USMES program and amount of diffusion activities engaged in by regional USMES Resource Teams. Multiple regression analysis was employed to assess the relationships between team characteristics and the dependent variables of implementation and diffusion. The following model was used:

$$Y^1 = A + B_1X_1 + B_2X_2 + \ldots B_kX_k$$

where:

Y^1 = the dependent variable (Implementation or Diffusion)

$X_1 - X_k$ = independent variables representing various team characteristics

Secondly, each independent variable was separately correlated to each of the dependent variables using the Pearson Product-Moment procedure. This two methods of data analysis provided information describing the combined relationship of all the independent variables and also single order relationships to the dependent variables.

Assumptions

The following statements are provided to identify specific peoperties of this study against which any findings must be weighted. Only those factors which are unusual in nature or of primary importance to the investigator

are noted.

1. It is assumed that a two-week delay in distributing the follow-up questionnaire (post-RTW), due to the USMES Project staff collecting data at the same time, did not alter the data collected in relation to the study.

2. It is assumed that any assistance in implementation and diffusion to the Resource Teams by USMES Central will be equally available to all teams.

3. It is assumed that responses to the self-report questionnaire by team members will be valid.

Limitations Effecting This Study

1. The sample of team members from which data was collected was drawn from only those team members who attended the Resource Team Workshop at St. Louis, Missouri, June 30 -- July 11, 1975. No data was collected from those team members who did not attend the Resource Team Workshop.

2. Two of the Regional USMES Resource Teams were formed with the assistance of the principal investigator of this study. It is believed that no unusual influences effected these two teams as a result of this involvement.

Definition of Terms

Diffusion - The spreading of a new idea, concept, or program to other people, organizations, or social systems.

District Resource Team - A team of personnel, from the same school system, trained to implement and diffuse a program in the school system they represent.

Growth - A dimension of organizational health emphasizing innovativeness, autonomy, adaptation, and problem-solving adequacy.

Implementation - The utilization and introduction of a new idea, concept, piece of equipment, or program into a social system with planned institutionalization occuring.

Implementation Activity Report - A report, prepared by any member of an USMES Resource Team, each time the team engages in an activity to diffuse information about or to train additional personnel to implement the USMES program.

Maintenance - A dimension of organizational health composed of three components - resource utilization, cohesiveness, and morale.

Organizational Health - A property of organizations which explains their ability or lack of ability to survive in their environment, cope adequately over the long haul, and continuously develop and extend their surviving and coping abilities.

Resource Team Workshop (RTW) - An NSF funded institute designed to train educational teams in the utilization, implementation, and diffusion of innovative programs.

Regional USMES Resource Team - A team of personnel, representing more than one school system or educational organization, trained to implement and diffuse the USMES program (USMES, 1974).

Role - A commonly held label, for a similar set of activities and behaviors, for a position within an organization and generally recognized by the same label in other organizations. (e.g. teacher, principal) (Katz & Kahn, 1966)

Task - A dimension of organizational health encompassing goal focus, communications adequacy, and optional power equalization. (Miles, 1965)

Unified Science and Mathematics for Elementary Schools (USMES) - A project, funded by the National Science Foundation, that was formed in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools. USMES has as its goal the development and implementation of real problem solving as an important style of education.

USMES Central Staff - Those persons officially employed by the USMES Project and operate out of the Education Development Center, Newton, MA.

USMES Informational - A session of less than one day's duration designed to inform people about the USMES program.

USMES Resource Personnel Workshop (RPW) - An NSF funded institute designed to train educational personnel in the utilization, implementation, and diffusion of the USMES program.

1975 USMES Resource Team Program - A Resource Team Workshop, funded by NSF through a grant to the USMES Project, designed to form and train regionally-based USMES Resource Teams.

USMES Teacher Log - A report, prepared by each teaching member of an USMES Resource Team, describing the activities of children in their class each time an USMES session is held.

USMES Team Report - A monthly report prepared by each team leader detailing the activities of a Resource Team and filed with the USMES Project.

USMES Workshop - A session designed to train personnel in the use of the USMES program with the intent of implementation to follow.

Chapter II

Review of the Literature

As any investigator begins to specify and delineate the scope and intent of the topic under question, he is tempted to project generalizations on a purely "working basis." In this case of entering into a study of assessing the implementation and diffusion strategy of regional resource teams, the investigator originally assumed that since in excess of 400 million dollars had been spent within the last twenty years by local, state, and national funding agencies on related styles of educational implementation, there would be a wealth of data, dissertations, research studies, and other forms of formative and summative assessment findings available to draw from as a base for this study. Such was not the case. Since NSF began supporting Resource Personnel Workshops and Resource Team Workshops in 1967, totaling 151 separately funded institutes, at a cost of over 7 million dollars, only two studies, centering on RPW's and RTW's, were found which were directly concerned with implementation and diffusion.[1] Robert Howe (1974) in compling a review of the research for ERIC/SMEAC

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[1] Science Curriculum Review Team, Pre-College Science Curriculum Activities of the National Science Foundation (Washington, D. C.: National Science Foundation, 1975), p. 26.

on the impact of NSF programs in elementary and secondary education was unable to cite one research study which was concerned with actual implementation.[2] Linda Sikorski (1975), under contract from the National Science Foundation to provide a summary of knowledge related to implementation was also not able to cite any reference to any project or research study which was based on the various types of institutes and workshops sponsored by NSF funding during the past twenty to twenty-five years.[3] Although this lack of a substantial body of research, relating to the notion of resource team and resulting levels of implementation and diffusion was disturbing, it did provide direction in the very difficult but essential task of conceptualizing the problem to be studied. It slowly and gradually became apparent that the type of study warranted at the present time was one of wide-ranging exploratory design. Hence in the absence of previous research sufficient to identify potential aspects of implementation/diffusion for an indepth analysis, it became evident that the literature review would have to encompass many related areas of study. The

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[2]Robert W. Howe, Impact of NSF Sponsored Programs on Elementary and Secondary School Programs, Teachers, and Students (Columbus, Ohio: ERIC/SMEAC, 1974).

[3]Linda A. Silorski, "An Analytical Summary of Knowledge About Curricula Implementation in U.S. Schools," Pre-College Science Curriculum Activities of the National Science Foundation, (Washington, D. C.: National Science Foundation, 1975).

review of the literature in this study was central to the generation of a set of variables which appeared to have promise for study. Therefore, the variables chosen for inclusion in this research effort were not totally identified from prior research on resource teams striving to implement and diffuse new curriculum programs specifically. They have, because of the obvious lack of prior systematic research, been culled from the more general arenas of educational innovations, change theory, organizational theory, diffusion research, and case studies of alternative implementation strategies.

As a beginning, the first venture in the process of identifying, evaluating, and summarizing the related literature on a specific topic has to be sporadic, uneven, and generally unsystematic, at best. This is essentially a function of discovering how information on the identified topic or problem has been organized and classified within the various major sources of information retrievial systems such as ERIC, Dissertation Abstracts, journal indicies, etc. This method of random searches into the literature sources soon gives way to the development of descriptor terms which allows a more coherent and reliable collection and review process. This same pattern emerges when the researcher attempts to process, categorize, and store pertinent aspects of information. Some means of relating numerous pieces of information must be found in order not to lapse into

information overload. Some researchers may find that the same categories used to select potentially valuable information are also useful to form the structure of the actual report of the literature review section of the complete study. Such was not the case with this effort, since numerous findings in sociology and organizational development were found to be of value and related well to the central hypothesis of this study. It was necessary, therefore, to devise a classification method unique to the questions generated in the actual searching process itself.

The review of the literature for this study has been divided into two major divisions, with each division having sub-divisions. The first to be discussed is that of prior attempts to aid personnel in preparing for and instituting change. This would include reports on RPW's RTW's, summer institutes, adoption factors, and training individuals versus teams. The second sub-division draws mainly from research on organizational factors which appear to relate to implementation, diffusion, reward systems, and role definitions which are only recently perceived to be of importance to educational change. As this review attempts to document, there may have been some tendency in past educational change strategies to ignore the strong influence organizational factors play in successful change undertakings on the part of the educational community in general.

Previous Training Programs

In Chapter 1 of this study a brief description of the development of the institute notion eventually leading to the development of RPW's and RTW's was presented. It does not seem necessary to repeat essentially all of that material in this section of the study. Instead, a summation of the basic ideas will be stated, followed by a continuation of additional information and data related to the same point.

The Individual as the Focal Point: The majority of institutes prior to 1967, explictly or implicitly, viewed the individual teacher as the focus of change efforts. Thus, it was believed that if a change is made in the individuals thinking, attitudes, or style of teaching, the institute participant will return to the institution they represent and initiate that change[4,5,6] This, however, was not found to be the case in reports by Krieghbaum[7],

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[4]Herbert Walberg and Arthus Rothman, "Teacher Achievement and Student Learning," Science Education, Vol. 53, (1969), pp. 256-257.

[5]Eugene P. Northrop, Reflections on Education in the Sciences, cited in An Investment in Knowledge by Hiller Krieghbaum and Hugh Rawson, (New York: New York University Press, 1969), p. 154.

[6]Daniel Katz and Robert Kahn, The Social Psychology of Organizations, (New York: Wiley and Sons, 1966) p. 391.

[7]Hiller Krieghbaum and Hugh Rawson, An Investment in Knowledge, (New York: New York University Press, 1969), p. 312.

Schlechty[8], Highwood and Mertens[9], Hendren[10], Cirrincione[11], and Vuicich.[12] These all focused attention on the failure of isolated individuals, trained in various types of institutes to initiate, maintain, and institutionalize the innovation in which they had been trained. Girault and Gross, in conceptualizing a Resource Personnel Workshop for social studies, comment on their previous experiences with institutes which viewed the individual participant as the focus of future change:

> Individual teachers going off to such experience, typically a brief summer program, had come back to their classrooms by the many thousands; but they commonly lose their enthusiasm for reform before the year is out. Indeed, the morass that characterizes numerous school systems when it comes to fundamental change has so engulfed most teachers that after a year, even in their own classes, there is serious retrogression, the new insights and approaches gleaned from institutes are rapidly lost.[13]

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[8]Phillip C. Schlechty, "Organizing for Change," Tarheel Social Studies Bulletin, Vol. 18-1, (1970), p. 16.

[9]Joyce E. Highwood and Thomas R. Mertens, "Evaluations of NSF Summer Institutes," American Biology Teacher, Vol. 34-4, (1972), p. 216.

[10]Julianne Hendren, et. al., "A Study of an NSF Institute," American Biology Teacher, Vol. 35-9, (1973), p. 510.

[11]Joseph M. Cirrincione, "A Teacher-Oriented Strategy for Implementing the High School Geography Project," Indiana Social Studies Quarterly, Vol. 27-1, (1974), p. 24.

[12]George Vuicich, "The RPW as a High School Geography Diffusion Mechanism," Indiana Social Studies Quarterly, Vol. 27-1, (1974), p. 24.

[13]Emily S. Girault and Richard E. Gross, "Resource Personnel Workshops: A Team Approach to Educational Change," Social Education, Vol. 37-3, (1973), p. 201.

After two years as a director of an NSF implementation project McLeod questioned the continued reliance on the individual as fostering change. His experience emphasized that it may be possible for this strategy to work when one is dealing with a small, highly specialized clientele, such as physics teachers, where the number of mediating variables is reduced. He cautions, however, that when implementation efforts involve a more general and diverse population, the pertinent factors increase dramatically and quickly overcome any single individual's coping ability.[14]

Carlsen[15], Eibler[16], and Hughes[17] all concluded after extensive research in the area of adoption of educational innovations that the isolation of individuals works against the process of adoption and subsequent implementation of

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[14]Richard McLeod, "A Science Program Director and A Behavioral Scientist Learn From One Another: Two Years of Collaboration," (Paper read at the American Educational Research Association, February, 1971, New York City), p. 1.

[15]R. D. Carlsen, Adoption of Educational Innovations (Eugene, Oregon: CASEA, 1965).

[16]H. J. Eibler, "A Comparison of the Relationships Between Certain Aspects of Characteristics of the Structure of the High School Faculty and the Amount of Curriculum Innovation" (unpublished Doctor's dissertation, University of Michigan, 1965).

[17]Larry W. Hughes, "Organizational Climate Found in Central Administrative Offices of Selected Highly Innovative and Non-Innovative School Districts in Ohio," (unpublished Doctor's dissertation, the Ohio State University, 1965).

all forms of educational innovations and changes. Sikorski reports that attempts at the New School of Behavioral Studies in Education (North Dakota, 1968-1972) to train teachers for individualizing instruction, that developers were forced to reject application from schools where a single teacher was to be involved. It was concluded that, the isolation of a single teacher was a definite limitation to successful implementation of the innovative approaches being tried.[18]

As early as 1951, prior to the major use of summer institutes, Cartwright cautioned planners by saying:

> A workshop, institute, or special training course often develops keen interest among the participants, high enthusiasm, and a firm resolve to apply all the wonderful new insights back home. It seems to be the case, that after an initial burst of activity participants "settle back".[19]

In describing what happens to participants, Cartwright noted:

1) No one else shares his enthusiasm and his new insights are not welcome
2) Lack of logistical support
3) He tries the new ideas, receives negative feedback and has no other person to talk with about alternative procedures.[20]

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18 Linda A. Silorski, op. cit., pp. 131-132.

19 D. Cartwright, Achieving Change in People: Some Applications of Group Dynamics Theory, Bobbs-Merrill Reprint Series in the Social Sciences, No. 39 (1951).

20 Cartwright, op. cit.

This research, however, was based on innovations in social systems and industry. Educational personnel did not, and generally do not even today, see the possible implications in designing educational implementation strategies.

Piburn in evaluating the training of teachers and implementation rates of the Time, Space, and Matter program, concluded that; the isolate teacher may lack important resources to act as a catalytic agent, such as time, secretarial assistance, political contacts, access to the administration, sample materials and incentives to use as encouragement.[21] The evidence suggests it is reasonable to conclude that a substantial number of personnel involved in implemenation of innovations (educational settings and otherwise), have seriously questioned the persistent emphasis on changing organizational behaviors by attempting to influence individuals. Katz and Kahn conclude, on the basis of applying open-systems concepts to organizations, that to assume that since organizations are composed of individuals, that by changing them, we change the organization, is false and has not worked.[22]

Influenced by reports such as cited above, educational planners began to search for alternative implementation

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[21] Michael D. Piburn, "Teacher Training and the Implementation of Time, Space, and Matter," Science Education, Vol. 56-2, (1972), pp. 197-205.

[22] Daniel Katz and Robert Kahn, op. cit., pp. 386-393.

tactics. The National Science Foundation, began in 1967, began to provide funds to test out the feasibility of such alternatives which eventually became known as Resource Personnel Workshop (RPW's) and Resource Team Workshops (RTW's)[23] The RPW, which later evolved into the RTW, incorporated several aspects which were not present in prior workshops such as: more than one person from a school system or school; inclusion of personnel other than classroom teachers in the workshops; participant involvement in the planning and development of the workshops; and emphasizing the development of implementation plans specific to the locality that the participants represent. Many of these changes were instituted on the strength of research being conducted on organizational change theory and the developing conceptualization that schools are in fact, a social system and exhibit characteristics similar to formal organizations. Watson, in one of the first attempts to apply organizational development tactics to school systems, identifies five pre-conditions needed for any successful attempts at change:

1) participants must feel that the project is their own and not wholly devised by others
2) the project must have the whole-hearted support of senior officials of the systems
3) the project must be in fairly close accord with the values and ideals of the participants

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[23] George Vuicich, op. cit., pp. 22-25.

4) the participants should experience support, trust, acceptance, and confidence in their relations with one another
5) participants must feel that their autonomy and security are not threatened[24]

Heathers in addressing a symposium on change in schools states that, "A critical fault in many change programs has been a failure to involve key participants in choosing and planning the program."[25] In a position paper endorsing the effect of risk-taking in implementation of innovations, Giacquinta cautions that it may not be the new materials, equipment, or trappings inherent in most new ideas that are perceived as a threat, but it is the fear of new roles in which teachers and other personnel are expected to engage in, that result in the construction of psychological barriers.[26] When attempting to establish guidelines for educational reform and renewal, many agents of change cite the necessity of teachers operating in multiple roles during the implementation activities of institutionalizing a change. Howey indicates that adequate training models must incorporate this reality and specifically provide experiences

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[24]George Watson, "Toward a Conceptual Architecture of A Self-Renewing School System" in Change in School Systems, edited by George Watson, (Washington, D. C.: NTL-NEA, 1967) p. 106-115.

[25]Glen Heathers, Planned Educational Change in Search of A Research Tradition, (Philadelphia, PA: Research for Better Schools, 1974), p. 8 (ERIC 108-303).

[26]Joseph B. Giacquinta, "Status Risk-Taking: A Central Issue in the Initiation and Implementation of Public School Innovations," Journal of Research and Development in Education, Vol. 9-1, (1975), pp. 102-114.

for teachers to practice these roles prior to returning to their school systems.[27]

Sweetser in a case study of a project involving personnel from the areas of math, science, and reading, concludes that increased communications between the training program and the participating school systems is essential.

> Perhaps a training program cannot strongly influence a school system, unless there are more specific and direct links between the training program and the school district . . . . additional links with the EXTEP participant and his school following the program are needed.[28]

Marker and Mehlinger, as principal investigators of a two year social studies field agent training program, concluded that although the agents' personality and degree of school system support were the most important factors in success, follow-up support from the training staff was essential.[29] Friedlander, in a study of industrial-based consulting and group development found that the teams of personnel which

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[27]Kenneth R. Howey, "Preconditions for Education Renewal and Reform," Journal of Teacher Education, Vol. 26-1, (1975), p. 11.

[28]Evan A. Sweetser, "A Descriptive Case Study of an Elementary Teacher Education Program of Science, Mathematics, and Reading for Experienced Teachers," (Unpublished Doctor's dissertation, Michigan State University, 1968), p. 164.

[29]Gerald W. Marker and Howard D. Mehlinger, "Report of the Social Studies Field Agent Training Program," (Bloomington, Indiana: Indiana University Foundation, 1972), ERIC abstract, (ERIC 076 463).

had the most pre- and post-contact with the outside trainers showed the greatest change.[30] This same factor was identified as a criterion for successful change in a Rand Corporation study, commissioned by the U. S. Government to review all federal funded educational change-oriented projects in the late 1960's and early 1970's.[31] Greenwood[32] and Williams[33] found that the level of implementation and diffusion of educational and agricultural innovations was significantly correlated to the number of persons in a single school or site. Both conclude that successful institutionalization of an innovation requires a critical mass of participants. Williams in particular, found that the number of teachers in an agriculture department and the degree of teacher innovativeness accounted for 52% of the variance in a regression equation.

Factors Relating to Team Success: As the concept of training change or resource teams began to be applied to

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[30]F. Friedlander, "A Comparative Study of Consulting Processes and Group Development," Journal of Applied Behavioral Sciences, Vol. 4, (1968), pp. 377-399.

[31]Peter W. Greenwood, The Process of Change, Federal Programs Supporting Educational Change, Vol. 3, (Santa Monica, California: Rand Corporation, 1975), p. 9 (ERIC 108 325).

[32]Ibid., p. 10.

[33]David L. Williams and William L. Hall, "Variables Influencing Adoption of Cooperative Agriculture Occupations Curricula," U. S. Office of Education, Final Report (Grant No. OEG-1-7-070052-4587), p. 17 (ERIC 023 867), 1968.

educational innovations, there was a parallel concern for the explicit and implicit designing of the workshop experience. During 1971 and 1972 the National Science Foundation funded a series of conferences from which a planning and management manual for future NSF workshops could be developed.[34] This manual expanded the concept of "temporary systems" originally discussed by Miles in Innovation in Education, still considered a classic and functional overview of educational change.[35] Miles' development of the "temporary system" strategy to initiate change placed heavy emphasis on participant involvement in the planning, operation, and follow-up activities of the training program.[36] Berman states, ". . .the design choices made to implement the innovation consistently had significant effects on implementation outcomes."[37] It was also discovered that regular and frequent meetings of those involved in the change were significant when

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[34] Robert Bernoff, Emily Girault, and Mary Budd Rowe, The Application of Temporary Systems Concepts to Effective Planning and Management of Short Term Educational Programs, (Washington, D. C.: National Science Foundation, 1973), Grant -GW-4508.

[35] Mathew B. Miles, "On Temporary Systems" in Innovation in Education, (New York: New York University Press, 1965).

[36] Ibid., p. 643.

[37] Paul Berman, Factors Affecting Change Agents Projects, Federal Programs Supporting Educational Change, Vol. 2, (Santa Monica, Calif.: Rand Corporation, 1975), p. 76, (ERIC 108 324).

correlated to implementation outcomes.[38] This supports the conclusions referenced earlier, which imply that failure or lower rates of implementation and diffusion were a function of isolated individuals attempting innovations. Bass and Leavitt found that in 12 matched trios which were given tasks to perform with a) no plan b) specific plans, and (c) self plan, the group which developed their own plan was more efficient, self-satisfying, felt a sense of responsibility, and enjoyed more satisfaction with the assignment than did the other groups. Results showed a strong positive relationship between participation in planning and morale-productivity.[39] This same strategy of participants developing their own implementation and diffusion plan has become an integral part of RPW's and RTW's. Almost no research exists which compares teams and isolated individuals who are implementing the same innovation. May, in a study of a SCIS RPW composed of teams and individuals, found that there was no difference in the number of diffusion activities engaged in by either teams or individuals. He does caution the reader that these results may be influenced by the manner in which some

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[38] Ibid, p. 77.

[39] Bernard M. Bass and Harold S. Leavitt, "Experiments in Planning and Operating," Management Science, Vol. 9, (1963), pp. 574-585.

of the teams were formed.[40] In a comparison of isolates to dyads, measuring the introduction and implementation of a curriculum innovation, Partlett found no difference. When, however, two or more dyads collaborated together, an increase in implementation did occur.[41] Bridges found in evaluating twenty, four-person teams on productivity, efficiency, and risk-taking, that those teams having a school principal as a team member were less productive than those teams composed only of teachers.[42] In 1973, Hering reported in a case study of four teams trained at a Resource Personnel Workshop in North Carolina, that the team with the highest success was the only team with no administrator. He does note that because of the small number of teams (four), the results are tentative at best.[43] In contrast,

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[40]David Henry May, "A Descriptive Study of Selected Workshop Factors Affecting the Training and Support of Resource Personnel in a Science Curriculum," Dissertation abstracts, 33/09, p. 4968 (University of Michigan, 1972).

[41]Guilford H. Bartlett, Jr., Analysis of the Introduction and Implementation of Curriculum Innovations, Final Report HEW Grant No. OEG-2-70-00005(509), Columbia University, 1971, pp. 132-133 (ERIC 054 540).

[42]Edwin M. Bridges, Wayne Doyle, and David Mahan, "Effects of Hierarchical Differentiation on Group Productivity, Efficiency, and Risk-Taking," Administrative Science Quarterly, Vol. 13-2, (1968), pp. 308-319.

[43]William Hering, "Some Effects of Change Teams on The Dissemination of New Curricula Materials," (unpublished Doctor's dissertation, University of Illinois at Urbana, 1973), p. 45.

Andersen and Horn found that in participants of the Colorado Elementary Science Project for implementation and diffusion of ESS, SAPA, and SCIS that the involvement of elementary principals increased the activity of the resource personnel trained in the RPW.[44]

Team Cohesiveness and Effectiveness: A considerable amount of research has been conducted in non-educational fields linking the psychological climate within a group to its productivity. The majority of these findings and conclusions are discussed in a later section of this chapter with only those studies related to educational change or resource teams reported here.

Richburg and Carswell monitored the development, training, and success levels of teams in a 1969-70 Resource Personnel Workshop designed to implement and diffuse the High School Geography Project. They concluded that success or failure of the implementation rested on:

1. cohesiveness of the team
2. level of administrative support for materials
3. development of local training programs[45]

Vuicich in assessing the RPW model as a diffusion mechanism

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[44] Ronald D. Anderson and Jerry G. Horn, "Diffusion of the New Elementary School Science: An Assessment of One Model," Science Education, Vol. 36-3, (1972), p. 326.

[45] Robert W. Richburg and Ronald J. B. Carswell, "Dissemination of New Approaches to Content and Instruction: The High School Geography Project," Indiana Social Studies Quarterly, Vol. 27-1, (1974), p. 17.

states:

> In analysing team success, we found that the teams which left the workshop with the greatest degree of team cohesiveness generally experienced the most success during the following year.[46]

In 1971-72, in an evaluation of an RPW emphasizing team development at Stanford, Porter did not find a significant correlation between team cohesiveness and level of dissemination activities engaged in. She does acknowledge that her measure of team cohesiveness was based on response to a single question in a follow-up survey of participants one year after attending the RPW.[47] The data from this study does show that the two teams with the lowest "team cohesiveness" score were also lowest in levels of diffusion activities.[48] As these studies indicate, no definite conclusion has been reached in relating these two factors. Wolfe in a case study of six internal change teams from the same school system, concludes that:

> Substantial evidence was obtained, to support the basic contention that when the dimensions in all areas of concern (internal team development, task competence, and effective

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[46] George Vuicich, "The RPW As a High School Geography Project Diffusion Mechanism," Indiana Social Studies Quarterly, Vol. 27-1, (1974), p. 30.

[47] Patricia H. Porter, "Evaluating A Resource Personnel Workshop: A Team Leadership Approach to Educational Change," (unpublished Doctor's dissertation, Stanford University, 1974) p. 231.

[48] Ibid, p. 234.

> relationships with parent system) are not at least reasonably well resolved, such a team is unlikely to have a strong positive impact on the system.[49]

In a second aspect of the study by Porter, it was found that a strong relationship (r=+.78) existed between a team's commitment to its goals and their subsequent level of implementation and diffusion activities.[50] Wolfe's conclusions are also consistent with Porter when he states that:

> . . .the development of commitment among team members -- commitment to the team, to its purposes and objectives, and to the action involved in carrying out these objectives, clearly was a key issue and a serious source of constraint to the success of the six teams.[51]

Selsor, in conducting an analysis of factors relating to successful implementation of innovative science programs in elementary and secondary schools, indicates that the crucial factors are the enthusiasm of the teacher, the cooperation of the administration, and follow-up activities

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[49] Douglas E. Wolfe, "Developing Internal Teams for Innovations in Educational Systems," (unpublished Doctor's dissertation, Case Western Reserve University, 1969), p. 195.

[50] Patricia H. Porter, op. cit., pp. 235-238.

[51] Douglas E. Wolfe, op. cit., p. 208.

after initial training.[52]

Commitment of Resources to Teams by Localities: Many attempts have been made to assess the relationship between real or perceived support to those functioning in a change agent role and the level of success by the agent in question. Marker and Mehlinger found that for social studies change agents that the personality of the agent was the most important factor relating to success but that the degree of local commitment to the change was second.[53] When comparing the quantity of team activity and the budget expenditures for the teams trained in a SRSS-RPW, Girault and Gross found a perfect correlation.[54] Porter found a significant relationship between organizational support (released time, funds for materials, professional acceptance, course credits, and money to attend the RPW) and the level of diffusion activities for resource teams.[55] She further emphasizes

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[52]Will L. Selser and Don Q. Milliken, "An Analysis of Factors Successful in the Implementation of Innovative Programs in the Elementary and Secondary Rural Schools," (paper read at the National Association of Research in Science Teaching Convention, March, 1973, Detroit), p. 1.

[53]Gerald W. Marker and Howard D. Mehlinger, "Report of the Social Studies Field Agent Training Program," ERIC 076 463.

[54]Emily S. Girault and Richard E. Gross, op. cit., pp. 202-203.

[55]Patricia H. Porter, op. cit, p. 225.

these findings when she states:

> The single most important factors during both summers (two separate RPW's) were described (by participants) as the existence, or lack of existence, of organizational support, including the response of decision makers to the teams activities and the control they exerted on those efforts.[56]

The Brookings Institute released in 1975 a report on Head Start and Follow Through programs titled, Planned Variation in Education: Should We Give Up or Try Harder. This study attempted to address the question: "Why is there variation in implementation of innovations?" Their summary response was:

> The assignment of teachers to a new curriculum will not automatically result in full implementation, even if the model is complete and the training is good. Their implementation of a program depends on a complex set of factors, such as their opinion of the model, their previous methods of instruction, how long they have been teaching, and the level of their teaching skills. The organization in which the teachers work is also influential. If they must worry about funding problems or conflicts with the staff, for example, they may not be able to devote their full energies to implementing a new educational program.[57]

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[56] Ibid, p. 257.

[57] Alice M. Riulin and Michael P. Timpane, Planned Variation in Education: Should We Give Up or Try Harder, (Washington, D. C.: Brookings Institute, 1975), pp. 120-121.

In the study by Hering, although he found no relationship between presence of administrative personnel on a resource team to its level of success, there was a direct correlation (r=+1.0) between perceived school system support (by each team) and the level of implementation achieved by a team.[58] Sikorski, in her findings, reported to NSF that a different type of school system or organizational support was needed to encourage curricula innovations;

> . . .direct rewards such as financial renumeration or academic credit may be offered. Or distributors may attempt to instill attitudes conducive to effective change, so that teachers are personally and professionally committed to achieving certain outcomes. . . .For curriculum change to succeed, it is important that the incentive structure be geared to openness and risk-taking. . .[59]

Acceptance of Innovation and Implementation: A long standing practice in the development and implementation of educational innovations has been to involve teachers as much and as early as possible. This was generally accepted on the principle of democratic ideas that whoever is affected by a change should have a part in it. Giacquinta, however, states that this may not be the real and essential rationale for continuing this practice:

> . . .participation acts as an extinguisher of uncertainty and/or a suppressor of organizational members' estimations of risk. It does

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[58]William Hering, op. cit., p. 42.

[59]Linda A. Sikorski, op. cit., p. 129.

> this through the mechanism of communication. The interaction process set up by participation, when it works, probably does so because it clarifies and allays fears.[60]

The implication of this conclusion is that participation in the innovation process, thought to aid acceptance through breeding familiarity with the product, may actually be a means of reducing risk-taking levels. Beauchamp, a well known writer in curriculum theory, acknowledges that acceptance of a curriculum innovation may be related to teachers' perceptions of how appropriate the innovation is for their students regardless of what research, articles, principals, or salespeople say.[61]

In a study of attributes of innovations as a factor in diffusion, Clinton found that "attributes acruing to innovations are perhaps as relevant to implementation of innovations as are external factors . . . how a teacher perceives a new idea or thing."[62] A case study conducted by Shumacher in nine school systems implementing the same state adopted instructional package found that five factors seemed to be related to the level of actual implementation:

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[60]Joseph B. Giacquinta, "Status Risk-Taking: A Central Issue in the Initiation and Implementation of Public School Innovations," Journal of Research and Development in Education, Vol. 9-1, (1975), pp. 112-113.

[61]George A. Beauchamp, Curriculum Theory, 2nd edition, (Wilmette, Ill: Kagg Press, 1968), p. 113.

[62]Alfred Clinton, "A Study of Attributes of Educational Innovations As Factors in Diffusion," (unpublished Doctor's dissertation: University of Toronto, 1972), p. 75.

1. congruency of innovation with current teaching style
2. degree of teacher conceptual clarity of innovation
3. relevance of innovation to student culture as perceived by teacher
4. teachability of innovation; and
5. cooperative faculty social system.[63]

This first section reviewed the literature related to previous training programs and cited pertinent research in the following areas: change programs emphasizing the individual versus a team or group model; relationship of team cohesiveness, goal commitment and implementation rate; level of support from localities for implementation; and correlation between acceptance of the innovation and the rate of installation. The second division of this chapter will emphasize the importance of organization factors to rates of implementation/diffusion. It may be of significance to the reader that almost without exception all of the research reported in this section has been completed since 1970. Prior to that time only researchers in industrial sociology and management theory were actively seeking such data. As a result, there are an abundance of gaps or unresearched areas and in some cases inconsistent use

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[63] Sally Schumacher, "Limitations of a Research and Development (RD & D) Strategy in Diffusion: A Case Study of Nine Local Implementations of a State Adopted Curriculum," (paper presented at the National Council of Social Studies Convention, November, 1972, Boston), p. 41.

of terminology when one examines studies focusing on organizational factors influencing the implementation/diffusion rates of educational innovations.

Organizational Factors Related to Implementation/Diffusion

This second section of this chapter is divided into two components. The first deals with the concept of organizational health/climate and its application to schools and school districts as a social system, to its suitability to explain the actions of educational change teams, and how such a concept has been useful in explaining variations among attempts to implement innovations. The second aspect of organizational factors included here relate to such characteristics as size and complexity of the organization, support from the organization to increase rate of implementation, the reward system, and system acceptance of the innovation.

Organizational Health: Miles in conjunction with Carlson and Gallaher, through a grant from the Center for the Advanced Study of Educational Administration, prepared a series of working papers subsequently published as Change Processes in the Public Schools. The intent of this effort was to review past attempts in educational change to form the basis for a series of synthesizing generalizations or concepts for further exploration and study. Miles had for several years been investigating the potentiality

of applying the concepts and techniques of organizational development, common in the private enterprise component of our society, as a means of improving the public school system. He states:

> To use an image from Gestalt psychology, specific planned change attempts have most typically been "in figure", occupying the focus of attention, while the organization itself has remained the "ground".
>
> I believe this emphasis is both practically and theoretically unfortunate. It is time for us to recognize that successful efforts at planned change must take as a primary target the improvement of organizational health--the school system's ability not only to function effectively, but to develop and grow into a more fully-functioning system.[64]

Miles cautions the reader, by citing past failure to consider the setting (the ground) in which a planned change is to take place by noting that educators have not viewed the schools as a social or open system which advances the thesis that any new input in the system will cause seemingly unrelated parts of the system to respond. It is these subtle, but ever present and influential adjustments in the total system which may account for the success or failure of a proposed change. Miles also implies that only an

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[64] Matthew B. Miles, "Planned Change and Organizational Health: Figure and Ground" in Change Processes in Public Schools edited by Richard O. Carlson (Eugene, Oregon: Center for the Advanced Study of Educational Administration, 1965) pp. 11-12.

organization with optimum health characteristics is potentially capable of reacting positively to an innovation as a more fully-functional enitity.

Huberman, in a publication for UNESCO, comments on Miles notion.

> In general terms a healthy organization not only survives its environment, but continues to cope adequately over the long haul and continuously develops and extends its surviving and coping abilities.[65]

It is the contention of Miles that all to often we are completely absorbed in the "thinginess" of the particular innovation without any concern for the system into which the change will be institutionalized.[66] Figure 2 illustrates how the concept of organization, and its component dimensions, fits into a schematic of the organization into which the innovation will be introduced.[67] It should be evident from an examination of Figure 2 that, between the input and output component of an organization, the influence of the organizational health dimensions could be crucial to successful implementation of an

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[65] A. M. Huberman, Understanding Change in Education: An Introduction, (Paris: UNESCO, IBE, 1973), p. 56.

[66] Matthew B. Miles, op. cit., p. 13.

[67] Ibid, p. 16.

innovation. Miles goes beyond simply developing the concept of organizational health, by suggesting ten dimensions that seem to be characteristic of an organization which is able to cope adequately and respond positively to varied input from the environment. The ten dimensions are:

1. Goal Focus - goals of organization are clear to members and accepted by them
2. Communications Adequancy - communications both within and across the boundary lines of the organization are functional, allowing both horizontal and vertical information flow.
3. Optimal Power Equalization - decision-making power is centered on competence and plan
4. Resource Utilization - system inputs, particularly personnel, are used effectively, idealy not over-loading with demands or idling
5. Cohesiveness - the organization knows what it is about and its members are attracted to membership in the organization
6. Morale - Members have feelings of well-being, pleasure, and satisfaction
7. Innovative - the ability to grow, develop, and change and become more differentiated over time
8. Autonomy - interacts strongly with input from environment and is not dominated by them nor ignores such inputs
9. Adaptation - the ability to re-structure after mediating the dimensions of innovations and autonomy when conflicts between the organization and environment arise
10. Problem-Solving Adequacy - the organizations ability to respond to problems without utilization of excessive amounts of system energies.[68]

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[68] Ibid, pp. 17-22.

SCHEMATIC MODEL OF ORGANIZATION FUNCTIONING AND CHANGE ENVIRONMENT (Miles[67])

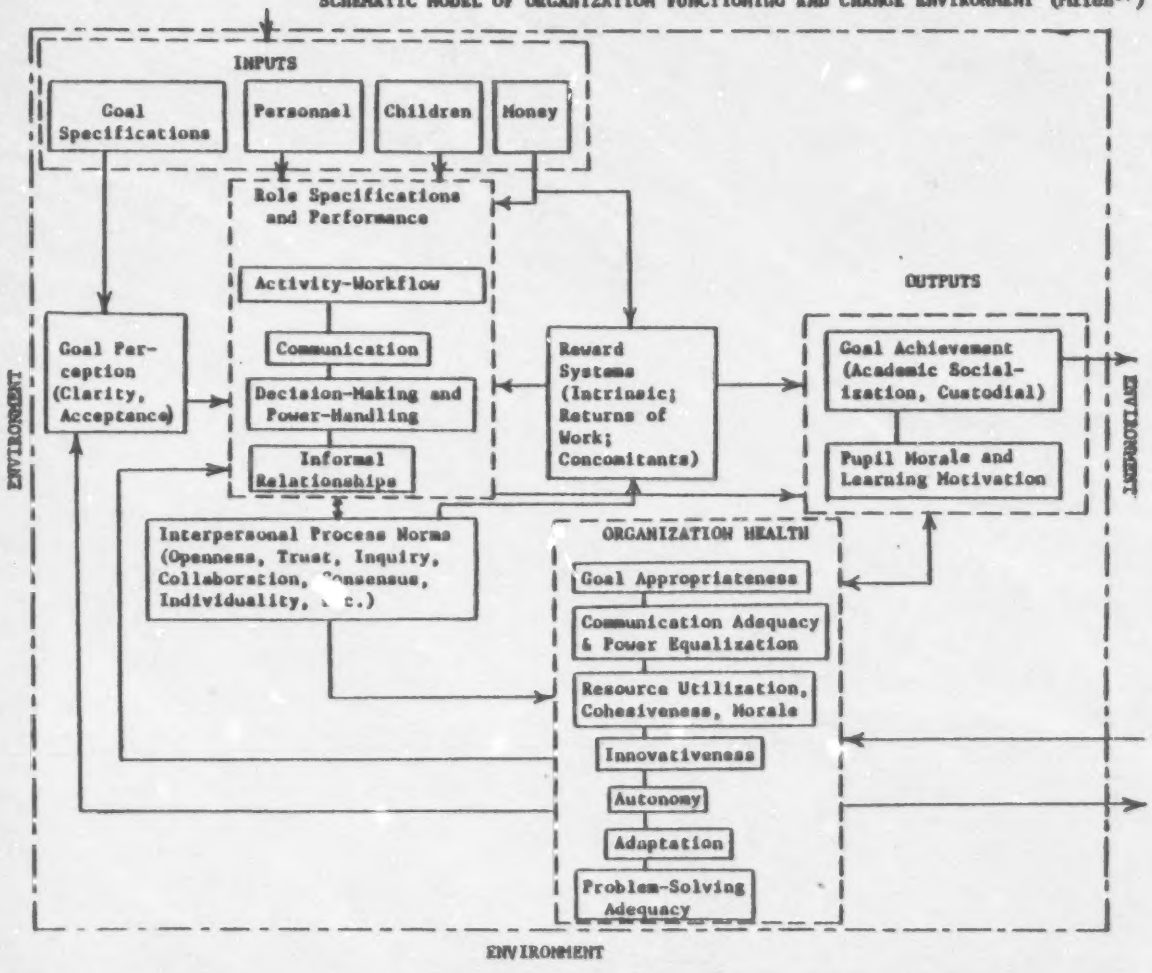

FIGURE 2

It is the intention of this investigator to apply Miles's concept and subsequent ten dimensions of organizational health to the implementation/diffusion tactic of regional resource team. Each team, during its training, was viewed as an organization and thus is subject to the same principles and concepts as one would apply to other variations of an organization. The following citations were selected not only to provide a basis for this decision but also to report such research that has already been recorded on the application of organizational health to change and implementation/diffusion of innovations.

As was cited previously, Porter found a strong relationship (r=+.78) between a team's commitment to its goals and the level of implementation/diffusion of SRSS material in an evaluation of two RPW's in 1970-1972.[69] Wolfe, in 1969 found that

> ". . .the development of commitment among team members -- commitment to the team, to its purposes and objectives, and to the actions involved in carrying out these objectives, was clearly a key issue and a serious source of constraint to the success of the six teams."[70]

when he investigated the factors related to the success of six internal change teams. Berman and Pauly, in a

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[69] Patricia H. Porter, op. cit., pp. 235-238.

[70] Douglas Earl Wolfe, op. cit., p. 208.

continuation of the Rand study on Federal Programs Supporting Educational Change, concluded that;

> In analyzing a sampling of 293 change projects the data on organizational climate and implementation success was consistently found to be significant.[71]

Specifically, they found that the following factors were related to implementation success.

morale of teachers - sig. = .001
support from principal - sig. = .10
support from superintendent - sig. = .15
support from faculty - sig. = .15

One is tempted to question the value of such low levels of significance for these factors, but this must be tempered with the knowledge that no other factors were found to be as related as were these. It must also be acknowledged that such factors are only functional in a complex organization, as they relate to each other, presenting possibly situations where it is not feasible or practical to totally isolate one from another. Hickey, in researching intergroup conflict and diffusion of innovations, found that initial conflict within a group tended to reduce group effectiveness throughout the life of the project.[72] Vuicich

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[71] Paul Berman and Edward W. Pauly, Factors Affecting Change Agent Projects: Federal Programs Supporting Educational Change, (Santa Monica, California: Rand Corporation, 1975), Vol. 2, pp. 68-76, (ERIC 108 324).

[72] Isabel A. Hickey, "Intergroup Conflicts and the Diffusion of Innovations: A Case Study," (Unpublished Doctor's dissertation, University of New York at Buffalo, 1969), Dissertation Abstracts, (31/04-A), p. 1904.

and Rieburg found that when assessing the factors related to successful resource teams in RPW's the degree of team cohesiveness was of the most significance.[73,74] In a case study of nine localities, all implementing identical art programs, Schumacher indicated that of the variables related to successful implementation, "a cooperative faculty social system" was among the top five predictors of success.[75] Maybury conducted a study of the implementation of science curricula in five countries (Bazil, Lebanon, Philippines, Argentina, and Turkey) and found three major areas of importance which accounted for the variations between countries;

1. organizational setting of the change
2. characteristics of the innovators
3. procedures used in implementation[76]

In this case study Maybury used Miles ten dimensions of organizational health as one index for discrepencies between teams. He states that:

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[73]Vuicich, op. cit., pp. 24-30.

[74]Robert W. Richburg and Ronald J. B. Carswell, op. cit., pp. 16-17.

[75]Sally Schumacher, op. cit., p. 12.

[76]Robert H. Mayburg, "Technical Assistance and Innovation in Science Education," Science Education, (Special Publication, 1975), p. 159.

> The case histories show how staff and committee discussions enjoy immediate message transmission and intimacy of relationship among the members of each unit. During my visits to these projects, I was able to observe directly such characteristics as goal-awareness and communications adequancy. Crowded work and office space only seemed to heighten the sense of participation in the creative work going on among their staff members.[77]

He notes that teams or projects which did not exhibit these dimensions were often overcome with internal conflict and productivity was predictably lower. Berman states ". . .the main factors affecting innovations were the institutional setting, particularly organizational climate and motivations of participants. . ."[78]

Hilfiker, using Halpin's Organizational Climate Description Questionnaire, reported that schools which had a more open climate consistently had greater success with innovations.[79] Swirsky, using the same instrument found that "these teachers choosing to accept the teaching practice (the innovation) tended to view the organizational climate as open and those who did not saw it as closed."[80]

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[77] Ibid, p. 166.

[78] Paul Berman and Edward W. Pauly, op. cit., p. 10.

[79] L. Hilfiker, Relationships of School System Innovativeness to Selected Dimensions of Interpersonal Behavior in Eight School Systems, (Madison, Wisconsin: Center for Cognitive Learning, 1969), Publication No. 171, pp. 42-46.

[80] Daniel Myran Swirsky, "Teachers Perception of Organizational Climate and Their Acceptance or Rejection of an Innovation in Classroom Practice," Dissertation Abstracts International, (31-04 A), p. 1282.

Greenwood, in the Rand report on educational change, concluded that:

> Implementation was most successful when based on strategies that fostered mutual adaptation and permitted it to take place, specifically; on-line planning efforts and continuing reassessments of project methods reflecting the belief that implementation was essentially an organizational project design and the institutional setting.[81]

Sweetser, in his study of the Experienced Teacher Fellowship Program at Michigan State, summarized his conclusions by saying,

> The organizational climate of the schools seems to be a limiting factor in the influence an EXTEP participant can exert.[82]

Pincus offers support to the concern for organizational factors, such as health, in his belief that; ". . .implementation of innovations is markedly affected by the bureaucratic structure and incentives of schools."[83]

Organizational Support and Change

This final section of chapter 2 presents a report of literature detailing the relationship between the level of organizational support an innovation receives to the success of that innovation has in implementation. Any one of these

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[81]Peter W. Greenwood, op. cit., p. 8.

[82]Evan A. Sweetser, op. cit., p. 161.

[83]John Pincus, "Incentives for Innovations in the Public Schools," Review of Educational Research, Vol. 44-1, (1974), p. 113.

variables could be the basis for an extensive literature search by itself and only sufficient reference is made to justify and support the generation of specific hypotheses for testing within the overall intent of this study.

As referenced earlier, Porter,[84] Hering,[85] and Girault,[86] in studying previous RPW's and RTW's, all concluded that organizational support was a prime influence in success of the teams trained. Porter also suggested that it would be of value to look at, ". . .the role structure of the back home organizations and the political dynamics involved in curriculum policy decisions."[87] Her concern was, that since many change teams have a high percentage of teachers included, what will be reaction of other personnel in the organization, to their new role. Sweetser indicates that to expect a classroom teacher to function as a change agent may be beyond the expected role definition we normally anticipate for teachers.[88] Mayburg spoke to the same point when he stated:

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[84] Patricia H. Porter, op. cit., p. 229.

[85] William Hering, op. cit., p. 42.

[86] Emily S. Girault and Richard Gross, op. cit, pp. 202-203.

[87] Patricia H. Porter, op. cit., p. 25.

[88] Evan A. Sweetser, op. cit., p. 161.

> If the potential innovator perceives himself, or is perceived by others, as having high authority and status, he may well decide to risk developing an innovation.[89]

In order for an innovation to be implemented it must, through its unique characteristics or by the personnel supporting the innovation, have qualities which will attract those who will eventually implement the proposed change.

Baldridge and Burnham react to this same question and respond by saying:

> Individual characteristics, such as age, sex and personal attitudes, do not seem to be important determinants of innovative behavior. However, administrative positions and roles do seem to have an important impact on the involvement of an individual in the innovation process. Structural characteristics of the organizations, such as size and complexity, strongly affect the organization's innovative behavior.[90]

Clearly, the inference is that an organization which can marshall a variety of positions and roles in support of an innovation will have a greater likelihood of achieving maximum implementation. Baldridge and Burnham continue this line of thought by reporting;

> The data strongly indicate that size and complexity are associated with increased adoption of educational innovations. It also seems reasonable that organizations adopting

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[89] Robert Maybury, op. cit., p. 167.

[90] J. Victor Baldridge and Robert A. Burnham, "Organizational Innovations: Individual, Organizational, and Environmental Inputs," Administrative Science Quarterly, Vol. 20 (1975), p. 165.

> innovations will sustain those innovations to the extent that a complex organizational system is built to support them.[91]

Shipman in Problems of Curriculum Innovation I reports research on the Schools Council, Integrated Studies Project (1969-1971) which linked success in implementation of the project to investment of time and energy by teachers and the system. An index of investment was designed to accomodate the factors: team meetings held, scheduling of time for use of Project materials, regular feedback, local authority appointed as leader, development of supplemental material, and attendance at conferences and meetings. Twenty-eight schools were rated by this index of investment with a maximum score of 18. The twenty-two schools who successfully implemented the Project averaged 14.0 on the index. The seven schools, rated implementation failures, averaged 6.9. Also rated were four schools who implemented the Integrated Studies Project independently of the official pilot program. All of these implementation efforts were successful and were rated an average of 14 on the 18 point investment scale.[92] Shipman concludes by

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[91] Ibid., p. 170.

[92] Shipman, Marten, "Measuring Success" in Problems of Curriculum Innovation I, edited by Eric Hoyle and Robert Bell, (London: The Open University Press, 1972), pp. 63-64.

inferring that in a context hostile to innovation there seems to be the existance of a threshold level of commitment below which innovations will fail, above which they have a chance to succeed.[93]

Under a grant from the U. S. Office of Education, titled Cooperative Project for Educational Development (COPED), Miles and others sought to explore means of increasing the innovative capacity of school systems through techniques of organizational development. After two years of intensive work with the staffs of several school systems, they concluded that school district and building-level innovativeness is a function of organization variables such as:

1. degree of leadership-sharing
2. personal support provided by principal
3. adequacy of problem-solving procedures
4. perception of reward system favoring creativity
5. degree of trust among colleagues
6. amount of teacher initiation of innovative proposals[94]

Baldridge and Burham support this acceptance of organizational factors in the implementation of innovations by suggesting that:

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[93] Ibid., p. 67.

[94] Cooperative Project for Educational Development (COPED): Final Report, (Washington, D. C: U. S. Office of Education, 1970), Vol. I, Project Number 8-0069.

> . . .the research on diffusion of innovations should shift from individuals to organizational structure and environmental factors.[95]

Sikorski concludes in the most recent and comprehensive summary of literature on the national curriculum reform projects that;

> In summary, the factors associated with success or failure of curriculum innovations have generally to do with aspects of capability and motivation, particularly as regards change planning, and with aspects of organizational structure.[96]

A number of studies have already been mentioned which allude to the value of having an innovation connected to someone who has central authority or who is perceived by others as having authority or high status in the organization. Yegge, Watson, and Winter examined the adoption and implementation of Project Physics and found that successful adoption and subsequent implementation; ". . .is most likely if the teacher's proposal to adopt has a broad base of administrative support. The principal's support is the most important."[97]

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[95] J. Victor Baldridge and Robert A. Burnham, op. cit. p. 176.

[96] Linda A. Sikorski, op. cit., p. 129.

[97] John F. Yegge, Fletcher W. Watson, and Stephen S. Winter, The Decision-Making Process in the Adoption of a New Physics Course in American High Schools: Final Report (Washington, D. C.: National Science Foundation, 1971), Grant No. GW 5210, p. XIII.

Another aspect of support an organization can make to sustain an innovation is funding. Anderson and Horn, assessing the diffusion and implementation of the new elementary science progress generalize that:

> If there is to be a successful district-wide implementation program, someone must be in charge of the district effort who is committed to the program and has the support of the district in tangible means, such as dollars.[98]

Mann, who worked with the installation of the S-APA and MACOS programs, found that the demonstration school (provided 55% of cost) taught 40% more units (90%-50%) than did the pilot school (0% local cost). Mann reports;

> In fact, demonstration schools taught more science (# of S-APA modules) in their first year than pilot schools taught in their third year of installation.[99]

and concludes with "Local commitment clearly follows local money."[100]

A second consideration in this review is how does an organization allocate its rewards and what effect does it have on the innovation process. Porter, using an index of released time, money for materials, professional acceptance, course costs and credits, and monies to participate

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[98]Ronald D. Anderson and Jerry G. Horn, "Diffusion of the New Elementary School Science: An Assessment of One Model," Science Education, Vol. 53-3, (1972), p. 324.

[99]James M. Mahan, "Overview of a Systematic Effort to Engineer and Monitor Curriculum Change: Emerging Guidelines and Encouraging Findings for Curriculum Installers," (paper presented at the American Educational Research Association, February, 1971, New York City), p. 6, (ERIC 047 367).

in an RPW found a significant correlation (r=+.81) between these organization incentives and level of success.[101] Sikorski[102] and Pincus[103] both support the thesis that for an innovation to be successfully implemented, the organization's reward system must be manipulated to visibly support the implementors.

The Ford Foundation, long a supporter of innovations in all areas of human endeavor, concede in their own examination of why their projects dissolved after a brief flourish:

> Without released time and without special credit or other credentialing recognition for participation, enthusiasm tended to wane after project funding ceased.[104]

In conclusion, this review has attempted to provide support for the underlying premise that successful implementation of innovations requires a far greater reliance, understanding, and manipulation of organizational factors then we had previously realized. It will be the intent of this research to add some additional support to the slowly growing and currently inadequate model of change and innovation under which we now operate.

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[100] Ibid., p. 9.

[101] Patricia A. Porter, op. cit., p. 225.

[102] Linda A. Sikorski, op. cit., p. 129.

[103] John Pincus, op. cit., p. 113.

[104] Paul Nachtigal, A Foundation Goes to School, (New York: Ford Foundation, 1972), p. 33.

Chapter III

METHODOLOGY

In Chapter I the basic problem to be studied was identified and the reader was presented with a rationale justifying its selection. Included, also, was a brief overview of the entire study. Chapter II summarized a review of the literature pertinent to the intent of the problem under study as a means of selecting potentially significant independent variables for inclusion in this investigation. Chapter III identifies the hypotheses to be tested, what means will be used to collect the data, an outline of the data collection process, and a description of how the data will be analyzed.

Hypotheses to be tested: There are three major hypotheses included in this study, with each major hypothesis also being related to each of the three independent variable clusters: this produces three sub-hypotheses for each dependent variable.

HO_1: There is no multiple linear relationship between the universal set of independent variables and the level of implementation of the USMES program (as measured by the average numbers of hours per week USMES is taught by members of the Regional USMES Resource Teams).

HO_{1-1}: There is no multiple linear relationship between the set of variables identified in the demographic independent variable cluster and the level of implementation of the USMES program (as measured by the average

number of hours per week USMES is taught by members of the Regional USMES Resource Teams).

HO_{1-2}: There is no multiple linear relationship between the set of variables identified in the Resource Team Workshop independent variable cluster and the level of implementation of the USMES program (as measured by the average number of hours per week USMES is taught by members of the Regional USMES Resource Teams).

HO_{1-3}: There is no multiple linear relationship between the set of variables identified in the Organizational Factors independent variable cluster and the level of implementation of the USMES program (as measured by the average number of hours per week USMES is taught by members of the Regional USMES Resource Teams).

HO_2: There is no multiple linear relationship between the universal set of independent variables and the level of implementation of the USMES program (as measured by the number of USMES units taught by members of the Regional USMES Resource Teams).

HO_{2-1}: There is no multiple linear relationship between the set of variables identified in the Demographic independent variable cluster and the level of implementation of the USMES program (as measured by the number of USMES units taught by members of the Regional USMES Resource Teams.)

HO_{2-2}: There is no multiple linear relationship between the set of variables identified in the Resource Team Workshop independent variable cluster and the level of implementation of the USMES program (as measured by the number of USMES units taught by members of the Regional USMES Resource Teams).

HO_{2-3}: There is no multiple linear relationship between the set of variables identified in the Organizational Factors independent variable clusters and the level of implementation of the USMES program (as measured by the number of USMES units taught by members of the Regional USMES Resource Teams).

HO_3: There is no multiple linear relationship between the universal set of independent variables and the level of diffusion of the USMES program by Regional USMES Resource Teams.

HO_{3-1}: There is no multiple linear relationship between the set of variables in the Demographic independent variable cluster and the level of diffusion of the USMES program by Regional USMES Resource Teams.

HO_{3-2}: There is no multiple linear relationship between the set of variables in the Resource Team Workshop independent variable cluster and the level of diffusion of the USMES program by Regional USMES Resource Teams.

HO_{3-3}: There is no multiple linear relationship between the set of variables in the Organizational Factors independent variable cluster and the level of diffusion of the USMES program by Regional USMES Resource Teams.

The relationship between each of the dependent and the set independent variables was assessed through the use of stepwise multiple linear regression. The essence of this investigation was to predict success in implementation and diffusion of the USMES program through a strategy identified as Regional Resource Teams from the most useful combinations of characteristics of the resource teams. The method chosen, stepwise multiple linear regression, appeared to be the most plausible manner in which to isolate a significant set of team characteristics.

Stepwise multiple linear regression is a procedure which produces the best prediction possible of a dependent variable using the fewest independent variables. The program constructs a prediction equation, one independent variable at a time. The first step is to choose the single variable which is the best predictor. The second independent variable to be added to

the regression equation is that which produces the best prediction in conjugation with the first variable. The program continues adding variables to the equation in this manner until no other variable will make a significant contribution to the prediction equation.

The multiple regression equation will be in the following form:

$$Y = A + B_1X_1 + B_2X_2 + \ldots B_kX_k$$

where:

Y = dependent variables -- implementation or diffusion
B = regression weight
X = team characteristics
A = constant

Development of Data Collecting Instruments: There were five data-collecting instruments used to assess the selected characteristics of the regional USMES Resource Teams:

Rating scale for proposals of resource teams submitted in December, 1974 - June, 1975 to USMES (RSP)
Pre-RTW participant questionnaire (June, 1975)
Post-RTW participant questionnaire (August, 1975)
Rating scale for implementation plans developed by teams at the RTW (RSIP)
Summary participant questionnaire (April, 1976)

Additional data on independent variables not included in these instruments was collected through the RTW roster, team reports, and implementation activity reports.

The rating scale for assessing the extent of a proposal (RSP) by a resource team, was developed by utilizing the criteria established by the USMES project. This criterion published in the USMES Resource Team Program Brochure

(Appendix A) was intended to establish a minimum level of commitment needed by institutions submitting a team proposal to the USMES project. The criteria, established by USMES, consisted of the following items:

1. Released time for planning
2. Financial support for materials
3. Permission to conduct dissemination activities
4. Agreement for teachers to teach USMES 3 hrs/week
5. Submit required reports to USMES

Each of the team's letter of commitment was read and rated accordingly based on the above criteria. (Appendix G) The percentage of agreement among three independent raters was 94%.

The second data gathering tool was a questionnaire for all RTW participants given the first morning of the workshop. The Pre-RTW form, developed with the staff of the USMES Project, was designed to assess the appeal of the USMES program prior to participation in the RTW by the resource teams. A pool of potential descriptors of the USMES program was reviewed by senior members of the USMES Project staff which included: project director, associate director for implementation, coordinator of resource teams, and special assistant for evaluation. Nine descriptors were agreed upon as reflecting the intent of the USMES program. Items number 24-33 on the Pre-RTW questionnaire represent this agreement of essential descriptors. (Appendix C). All RTW participants were asked to rank these descriptors on a 1 to 5 scale, low to high appeal respectively, and a mean score for each team was calculated as a measure of

the appeal of USMES to each resource team. Items number 43 and 45 provided data on perceived authority to implement USMES and satisfaction with other team members, respectively. Additional questions were included in the Pre-RTW questionnaire, either at the request of the USMES Project or which the investigator wished to have for future analysis, but are not utilized in this study.

The Post-RTW questionnaire included the previously described elements of the Pre-RTW form plus a section on the value of attending the RTW. The same procedure used in the design of the Pre-RTW form was employed for the items relating to the RTW experience. Eleven items were generated which the USMES staff and the investigator agreed were the key activities of the summer workshop. An additional nine items were included for the same reasons mentioned previously. Items used as the basis for a mean score of the value of the RTW for each resource team are 50, 52, 53, 55, 56, 57, 58, 60, 6[illegible], 67 and 69. Each RTW participant was asked to rank these items on a 1 to 5 scale, ranging from low to high value. The mean score for each resource team was used as the data base for this variable, value of the RTW.

The fourth assessment of data occurred in late April through a questionnaire mailed to all resource team members who were participants of the St. Louis RTW. This questionnaire had six sections, which are identified as;

(See also Appendix E)

Appeal of USMES*	Resource Training Workshops*
Limitations	Instructional and Dissemination
Present Status*	Activities
	Organizational Health

These sections marked with an asterisk have already been described and no further explanation is given here. The Limitations on USMES Implementation, questions #1-16 was selected from a review of the literature on change, a summary of potential barriers to implementation of USMES identified by participants of an USMES conference, and suggestions from the USMES Project staff. A mean team score for these questions was calculated and used as the data point for the independent variable, limitations on USMES implementation. The fifth section of the April questionnaire was concerned with the congruency between actual and ideal frequency of certain activities related to the use and dissimation of USMES. Questions #43-54 relate to use of USMES and #53-60 relate to activities associated with diffusion of the USMES program. The scoring of this section was based on calculating the mean difference between actual and ideal for each team indicating each teams congruency between actual and ideal level of these activities. The lower the mean value is for a particular team, the greater its consistency was in performing these activities at a level consistent with their intentions. Thus, two values were generated from this section, one mean relating to implementation and a second mean relating to dissemination.

The final element in the April questionnaire is a series of statements relating to the concept of organizational health as defined by Miles and discussed at length in Chapter II. The procedure for developing these fifteen statements was to first isolate the essential components of Miles' concept of organizational health. This was done by use of the ten dimensions identified by Miles, from which fifteen statements were written. The validity of these statements rests totally on the accuracy of the investigator's ability to translate them into statements reflecting the unique characteristics involved in regional resource teams. Although it would add considerable support to the validity and reliability of this section to have piloted it first and to have made comparisons with other organizational health instruments, this was not done for the following reasons:

1. no similar population is available for testing
2. the present population, currently under study, is already responding to a large request for data and this investigator could not justify another request for more of their time
3. the USMES Project is also conducting evaluation studies and additional requests for data from participants would likely reduce return rates

As was done with other sections of the team members' questionnaire, each response was totaled and a mean score for each team was used as the data entered into the regression equation.

The fifth data collecting instrument utilized in

this study was the Rating Scale for Implementation Plans (RSIP). All of the resource teams, while at the RTW, were assigned the task of completing a written plan detailing their implementation and diffusion activities for 1975-76. Each team was given a specific description of what should be included in their plan (see Appendix I). These guidelines were used to identify a total of 15 elements that each team's plan was evaluated against. A team's plan was reviewed to see if each of the criteria, included in the RSIP, has been incorporated in the implementation/diffusion plan submitted to USMES. The maximum socre a team could have received on the RSIP is 15. (Appendix H) Inter-rater reliability for the RSIP was 86%.

Data Collection Procedures

The collection of data for this study is catagorized into two components:

1. data on independent variables
2. data on dependent variables

As previously described there are two major modes by which the appropriate data was collected; self-report questionnaires and monthly team reports sent to USMES.

Collection of independent variable data: As outlined in Chapter I the independent variables were classified into three clusters:

1. Demographic
2. Acceptance of USMES and the RTW
3. Organizational factors

Collection of specific data on the variables included in each of these clusters occurred at the following three time periods, during the course of this study; prior to the beginning of the RTW (June, 1975), after completion of the RTW (August, 1975), and at the end of the first years' activity of the resource teams. Tables 3, 4, and 5 indicate the type of variable, time collected, and source for each of the independent variable clusters, previously identified.

Collection of dependent variable data: The dependent variables selected for this study were levels of implementation and diffusion of the USMES program. Data was collected on these variables through the following mechanisms: self-report questionnaires from RTW participants, team leaders, principals of participating schools, and college/university personnel; monthly team reports, and implementation activity reports.

The implementation level for each team was established by two quantitative measures already described in Chapter I.

1. The average number of hours per week USMES is taught by members of a team

2. The total number of USMES units taught in schools which are part of an USMES Resource Team

Each of the measures of team implementation was treated individually and a regression equation was generated indicating the relationship of all of the independent

TABLE 3

Demographic Variable Cluster

Variable	Time of Collection	Source
Size of Team at RTW	Pre-RTW	RTW Roster
Number of Institutions/Team	Pre-RTW	RTW Roster
Number of Teachers/team	Pre-RTW	RTW Roster
Number of Schools/team	Pre-RTW	RTW Roster
Ratio of teachers/non-teachers per team	Pre-RTW	RTW Roster
Number of school systems/team	Pre-RTW	RTW Roster
Number of roles/team	Pre-RTW	RTW Roster
Number of college/university personnel team	Pre-RTW	RTW Roster

TABLE 4

Resource Team Workshop Variable Cluster

Variable	Time Collected	Source
Appeal of USMES Program	Pre-Post RTW, April, 1976	RTW participants
Value of RTW by participants	Post-RTW, April, 1976	RTW participants
Team mini-workshops	Post-RTW, April, 1976	RTW participants
Work on USMES units at RTW	Post-RTW, April, 1976	RTW participants
Work on implementation plan at RTW	Post-RTW, April, 1976	RTW participants
Satisfaction of team composition	Pre-Post RTW	RTW participants
Team meetings at RTW	Post-RTW, April, 1976	RTW participants
Preceived authority to implement USMES	Pre-Post RTW	RTW participants

TABLE 5

Organizational Varialbe Cluster

Variable	Time Collected	Source
Letter of commitment to USMES	April, 1975	Team Proposal
Amount of financial support/team	April, 1976	Principals
Organizational Health of team	April, 1976	RTW participants
Perceived authority to implement USMES	Pre-Post RTW	RTW participants
Team implementation plan	Post-RTW	Implementation plans completed at RTW
Work on implementation plan at RTW	Post-RTW, April-76	Implementation plans completed at RTW
Number of different roles/team	Pre-RTW	RTW Roster
Number of team meeting held during year	April, 1976	Team Leaders
Mean difference (actual-ideal) instructional activities	April, 1976	RTW participants
Number of team meetings held prior to attending RTW	April, 1976	Team leaders
Team meetings at RTW	Post RTW	RTW participants
Mean difference (ideal-actual) of dissemination activities	April, 1976	RTW participants
Limitations (mean team score)	April, 1976	RTW participants
Role of Team Leader	Pre-RTW	RTW Roster

TABLE 6

Implementation Variables

Variable	Source
1. Average number of hours per week USMES is taught by team members	April, RTW questionnaire Principal's questionnaire
2. Total number of USMES units taught in schools which are part of an USMES Resource Team	April, RTW questionnaire Principal's questionnaire

Diffusion Variable

1. Number of USMES Informational Meetings, Number of USMES Workshops, Amount of publicity and number of times USMES included in pre-service and in-service college courses	Team reports, survey of team leaders, and college/ university reports

variables.

The average number of hours USMES is taught by each team was calculated by asking each teaching team member to indicate the number of hours per week they taught USMES. A team score was arrived at through an average of the individual teacher member's scores. The number of USMES units taught by a team was determined by totaling the number of times each team member has taught an USMES unit. Each of these measures was determined as part of the April questionnaire sent to all team members.

Diffusion, the second dependent variable, was assessed by determining the number of times specific diffusion activities were engaged in by each team. Each team leader was asked to identify the number of times their team was involved in the following types of activities.

a. number of informational meetings
b. number of workshops
c. amount of publicity
d. number of times USMES was included in pre-service and in-service courses through participating colleges/universities

The total score on diffusion for each team was determined by adding the individual responses to each of these four types of activities. This, again, is a quantitative measure of a variable and may not be related to the quality of the activities engaged in by each team. Some form of a qualitative assessment of the diffusion activities would obviously have the potential to become a more accurate assessment of

a team's diffusion impact, but no method is available that meets the criterion of practicability.

In summary, Chapter III has detailed the following:

1. Specific hypotheses to be tested,
2. Development of data collecting instruments,
3. Means of data collection, and
4. Method of analysis of data.

Chapter IV

Analysis of Data

Introduction

This study was designed to assess the relationship among selected characteristics of twenty-seven regionally-based USMES Resource Teams and their ability to implement and diffuse information about the USMES program. The characteristics selected for study were grouped into three independent variable clusters: demographic, Resource Team Workshop, and organizational factors. The dependent variables were; (1) average number of hours/week a team used the USMES program; (2) total number of USMES units taught by a team; and (3) number of diffusion activities engaged in by each team. As detailed in Chapter Two, multiple linear regression analysis was used to identify the relationship between each dependent variable and the independent variables. Since this study was exploratory in conception, the level of significance has been set at the .10 level. Correlations equal to or greater than this level of acceptance are identified with an asterisk.

The data for this investigation were collected through the following means: three questionnaires sent to all Resource Team members in June (1975), August (1975) and April (1976), monthly team reports sent to the USMES Project, and a questionnaire (April, 1976) sent to principals of schools

involved with an USMES Resource Team. The return rate on the three, team member questionnaires averaged 63.3%. The pre-RTW (June, 1975) return rate was 66%, the post-RTW (August, 1975) return was 63%, and the April (1976) rate was 61%. The sampling units for this study was each team. For each variable, team scores (either total scores orteam means were generated). The sample size for this study was twenty-seven teams, composed of 176 members.

Organization of Chapter IV

There were three major hypotheses under investigation in this study, with each hypothesis subsequently subdivided according to the independent variable clusters described in Chapter III. This produced a total of twelve regression hypotheses. The results are reported in this chapter.

In addition, to the twelve hypotheses outlined in Chapter III, three (3) hypotheses for reporting the single-order correlations among the independent and dependent variables have been added. This was done to illustrate the inter-correlations among independent variables which explain aspects of the multiple linear regression analysis. The three secondary hypotheses, for each of the three major hypothesis are reported immediately after the single-order correlation and then the results of the multiple linear regression analysis. After stating the results of analysis of the three independent variable clusters for each dependent variable, the results of

the multiple regression of all independent variables (universal cluster) will be reported. This format of reporting the sub-hypotheses and then the major hypothesis will be followed for each of the three dependent variables.

Dependent Variable - Mean Hours/Week of USMES/Team

This measure of implementation indicates the average number of hours per week the teaching members of a Resource Team reported utilizing the USMES Program.

Pearson's Correlations: Mean Hours/Weeks of USMES/Team

NULL HYPOTHESIS

THERE IS NO LINEAR RELATIONSHIP BETWEEN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE AVERAGE NUMBER OF HOURS PER WEEK USMES IS TAUGHT BY MEMBERS OF USMES RESOURCE TEAMS).

Six (6) of the independent variables were found to be significantly ($p \leq .10$) correlated to the dependent measure. Table 7 identifies the significantly correlated variables. Three of the variables were positively related to the mean hours/week a team teaches USMES. Thus, as the number of college personnel/team increases, as the perceived team value of working on the implementation plans increases, and as the organizational health score increases so does the mean hours/week USMES is taught by a team. Number of institutions and school systems/team were inversely related. Limitations on implementation was also negatively related.

TABLE 7

PEARSON'S CORRELATIONS: ALL VARIABLES WITH MEAN HRS/WK OF USMES/TEAM*

VARIABLE	PEARSON R
Number of college personnel/team	.4283
Number of institutions/team	-.3596
Number of schools/team	-.3596
Post-RTW, Value of Working on Implementation Plan	.4495
Organizational Health/Team	.3942
Limitations on Implementation	-.3747

*$p \leq .10$

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_{1-1}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE DEMOGRAPHIC INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE AVERAGE NUMBER OF HOURS PER WEEK USMES IS TAUGHT BY MEMBERS OF USMES RESOURCE TEAMS).

The analysis of this cluster of independent variables by multiple linear regression identified only one acceptable ($p \leq .10$) variable. Number of college personnel per team was found to account for 18 per cent of the variance ($p \leq .026$). Null hypothesis HO_{1-1} is therefore not rejected. Table 8 reports the findings of these analysis. Two other variables, number of institutions/team and number of schools/team, were excluded from the regression analysis because of their inter-correlation to the variable, number of college personnel/team. ($r = -.3764$ and $r = -.4669$, respectively).

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_{1-2}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE RTW INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE AVERAGE NUMBER OF HOURS PER WEEK USMES IS TAUGHT BY MEMBERS OF USMES RESOURCE TEAMS).

The Pearson's correlation procedure identified only the variable, Post-RTW value of work on the implementation plan, from the RTW cluster as correlated ($p \leq .10$) to the dependent measure. The analysis of these data by stepwise multiple linear regression did identify a set of variables which account for 57 per cent of the variance. ($p \leq .057$) The reader is cautioned in regards to these findings because of the complex interactions of these six variables. Table 9 shows the significance level of each of the six independent variables. Note that at step 2 the level of significance jumps from .019 to .117. At step 5

TABLE 8

DEMOGRAPHIC CLUSTER WITH NUMBER OF HRS/WK OF USMES/TEAM ($HO:_{1-1}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR008		5.61855	.026	.42837	.18350	.18350	.42837	5.61855	.026

TABLE 9

RTW CLUSTER WITH NUMBER OF HRS/WK OF USMES/TEAM ($HO:_{1-2}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFI-CANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVER-ALL F	SIGNIFI-CANCE
1	VAR021		6.33190	.019	.44955	.20209	.20209	.44955	6.33190	.019
2	VAR013		2.64816	.117	.53046	.28138	.07929	-.17748	4.69875	.019
3	VAR014		2.31704	.142	.58920	.34715	.06577	.26581	4.07674	.018
4	VAR019		2.20439	.152	.63766	.40661	.05946	-.15246	3.76877	.018
5	VAR015		3.16964	.089	.69601	.48443	.07782	.01720	3.94628	.011
6	VAR017		4.86481	.057	.75598	.57151	.08709	-.11410	4.44598	.005

VAR021 POST-RTW, VALUE OF WORK ON IMPLEMENTATION PLAN
VAR013 POST-RTW, APPEAL OF USMES
VAR014 APRIL, APPEAL OF USMES
VAR019 POST-RTW, VALUE OF WORKING ON USMES UNITS AT RTW
VAR015 POST-RTW, VALUE OF RTW
VAR017 POST-RTW, VALUE OF MINI-WORKSHOPS

$$Y(HO:_{1-2}) = 3.653 + .93\,(VAR021) - .30\,(VAR013) + .18\,(VAR014) - .69\,(VAR019) + .17\,(VAR015) - .83\,(VAR017)$$

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the level drops to .089 and then to .057 in step 6. It is this investigators belief that to conclude the analysis at step 1 would be an error while it would be equally erroneous not to caution the reader. Null hypothesis $HO:_{1-2}$ is therefore rejected, keeping in mind the above noted concern.

Three of the variables are positively related (Post-RTW, value of work on implementation plan; April, appeal of USMES; and Post-RTW, Value of RTW) indicating that as these team scores increase so did the number of Hrs/Wk USMES is taught. The other three variables (Post-RTW, Appeal of USMES; Post-RTW, value of working on USMES units at RTW; and Post-RTW, Value of mini-workshops) were negatively related indicating as a team's source increased on any of these variables their level of implementation decreased.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_{1-3}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE ORGANIZATIONAL FACTOR INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE AVERAGE NUMBER OF HOURS PER WEEK USMES IS TAUGHT BY MEMBERS OF USMES RESOURCE TEAMS).

No correlation coefficients were computed for two variables in this cluster because of insufficient data returns on; number of team meetings prior to the RTW and number of team meetings during 1975-76. Three variables were found to correlate with the dependent variable (number of hrs/wk); value of working an implementation plan during RTW (r=.4495) organizational health of team (r=.3942), and limitations

(r=-.3747).

The multiple linear regression procedure identified only one variable (work on implementation plan at RTW) as being significantly ($p \leq .10$) related to the dependent measure. This variable accounts for 20 per cent of the variance and has a level of significance equal to .019. Therefore, in this case the null hypothesis is not rejected. (Table 10) This analysis is somewhat misleading since two other independent measures are also significantly related to the same dependent measure (organizational health and limitations on implementation). Since these independent variables are highly interrelated and the stepwise multiple regression analysis selects the best predictor first and secondly adds the next variable to the total equation, these two variables become ignored. Thus, while the null hypothesis is not rejected, there are for practical reasons, three variables that similarly correlate with the dependent variable: work on implementation plan, organizational health of team, and limitations on implementation.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_1

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE AVERAGE NUMBERS OF HOURS PER WEEK USMES IS TAUGHT BY MEMBERS OF USMES RESOURCE TEAMS).

The multiple linear regression analysis using all of the independent variables, identified three (3) variables which

TABLE 10

ORGANIZATIONAL CLUSTER WITH MEAN HRS/WK OF USMES/TEAM (HO: $_{1-3}$)

STEP	VARIABLE ENTERED	F TO ENTER	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVER-ALL F	SIGNIFICANCE
1	VAR021	6.33190	.019	.4495	.20209	.20209	.4495	6.33190	.019

VAR021 POST-RTW, Work on Implementation Plan

account for 43 per cent of the variance and at a significance level of .004. Table 11 indicates the summary breakdown of the value of predictor variables. As in HO_{1-3}, the independent variables, organizational health and limitations, are omitted from the equation because of their intercorrelation to the variables POST-RTW work on implementation plan. Null hypothesis $HO:_1$ is therefore rejected.

This analysis indicates that as; Post-RTW, work on implementation plan at RTW and number of college personnel/team increase, so did the mean hrs/wk USMES was taught. The variable, rating of implementation plan was found to be negatively related.

DEPENDENT VARIABLE -- NUMBER OF USMES UNITS/TEAM

This second criterion of implementation places emphasis on the number of USMES units taught by members of an USMES Resource Team. USMES units taught by college/university members of a Resource Team, in undergraduate or graduate courses, are not included in this measure. Such activities by college/university are classified as diffusion are therefore included in the third dependent measure to be reported in this chapter.

PEARSON'S CORRELATIONS: Number of Units Taught/Team

NULL HYPOTHESIS:

THERE IS NO LINEAR RELATIONSHIP BETWEEN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM

TABLE 11

ALL VARIABLES WITH MEAN HRS/WK OF USMES/TEAM ($HO:_1$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR021		6.33190	.019	.44955	.20209	.20209	.44955	6.33190	.019
2	VAR008		3.41461	.077	.54907	.30147	.09938	.42837	5.17903	.013
3	VAR032		5.09409	.034	.65432	.42813	.12666	.08007	5.73970	.004

VAR021 POST-RTW WORK ON IMPLEMENTATION PLAN AT RTW

VAR008 NUMBER OF COLLEGE PERSONNEL/TEAM

VAR032 RATING OF IMPLEMENTATION PLAN

$$Y(HO:_1) = -1.98 + .76\ (VAR021) + .91\ (VAR008) - .86\ (VAR032)$$

(AS MEASURED BY THE NUMBER OF USMES UNITS TAUGHT BY MEMBERS OF AN USMES RESOURCE TEAM).

There were only two (2) of the independent variable which were significantly correlated ($p \leq .10$) to the dependent variable, number of USMES units/team. Table 12 identifies these two variables and strength of their correlation. This hypothesis is therefore rejected.

TABLE 12

PEARSON'S CORRELATION: ALL VARIABLES WITH NUMBER OF USMES UNITS/TEAM

VARIABLE	PEARSON r
Organizational Health	.3352*
Role of Team Leader	.4196*

*$p \leq .10$

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_{2-1}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE DEMOGRAPHIC INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF USMES UNITS TAUGHT BY MEMBERS OF AN USMES RESOURCE TEAM).

As in the analysis by the Pearson product-moment procedure, no multiple linear relationship among variables in the Demographic cluster was found when the data was analyzed by stepwise regression. Table 13 shows the first

step of the multiple linear regression analysis. Null hypothesis HO_{2-1} is therefore not rejected.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: HO_{2-2}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE RTW INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF USMES UNITS TAUGHT BY MEMBERS OF AN USMES RESOURCE TEAMS).

No single-order correlations or multiple linear relationships were found between the RTW independent variables and number of USMES units/team. Table 14 is a summary of the analysis by stepwise multiple linear regression. Null hypothesis $HO:_{2-2}$ is not rejected.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: $HO:_{2-3}$

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE ORGANIZATIONAL FACTOR INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF USMES UNITS TAUGHT BY MEMBERS OF AN USMES TEAM).

The Pearson's product-moment correlational analysis found two correlated variables identified in Table 12. Analysis of these data by multiple regression produces a far more complex picture of the interaction of these variables. Five variables were found to account for 74 per cent of the variance ($p \leq .004$). Table 15 identifies and presents the relationship of these independent variables to the dependent variable. The

TABLE 13

DEMOGRAPHIC CLUSTER WITH NUMBER OF USMES UNITS/TEAM ($HO:_{2-1}$)

STEP	VARIABLE ENTERED	F TO ENTER	SIGNIFI-CANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFI-CANCE
1	VAR005	2.32202	.140	.29153	.08499	.08499	.29153	2.32202	.140

TABLE 14

RTW CLUSTER WITH NUMBER OF USMES UNITS/TEAM ($HO:_{2-2}$)

1	VAR014	1.56735	.222	.24289	.05900	.5900	.24289	1.56735	.222

TABLE 15

ORGANIZATIONAL CLUSTER WITH NUMBER OF USMES UNITS/TEAM ($HO:_{2-3}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR038		5.34209	.029	.41960	.17606	.17606	.41960	5.34209	.029
2	VAR037		4.22083	.051	.54708	.29929	.12323	-.30762	5.12558	.014
3	VAR036		3.45375	.076	.62512	.39078	.09148	.14257	4.91765	.009
4	VAR027		3.35668	.081	.68660	.47142	.08065	.05945	4.90533	.006
5	VAR031		3.14494	.091	.73503	.73503	.06885	.33517	4.93586	.004

VAR038 ROLE OF TEAM LEADER

VAR037 LIMITATIONS ON IMPLEMENTATION

VAR036 MEAN DIFFERENCE: ACTUAL-IDEAL DIFFUSION ACTIVITIES

VAR027 PRE-RTW, AUTHORITY TO IMPLEMENT USMES

VAR031 ORGANIZATIONAL HEALTH

$$Y(HO:_{2-3}) = -29.85 + 7.86\ (VAR038) - 1.88\ (VAR037) + .70\ (VAR036) + 3.23\ (VAR027) + .21\ (VAR031)$$

null hypothesis, $HO:_{2-3}$ is therefore rejected.

Four (4) of the five (5) significant predictor variables are positively related to the dependent variable, number of USMES units taught/team. These data indicate that; having a college/university based team leader, higher ideal than actual level of diffusion activities, high perceived authority to implement USMES, and high organizational health are related positively to increased number of USMES units taught/team. The variable, limitations on implementation, was inversely related to the number of units taught/team.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS - HO_2

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF IMPLEMENTATION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF USMES UNITS TAUGHT BY MEMBERS OF AN USMES RESOURCE TEAM).

The analysis of the inter-relationships of these variables and the dependent variable by multiple linear regression analysis indicates that six independent variables account for 61 per cent of the variance ($p \leq .002$). Table 16 provides a summary of the regression analysis, identifying the following factors in explaining the amount of variance: role of team leader, limitations and implementation, mean difference between actual and ideal diffusion activities, pre-RTW authority to implement USMES, organizational health, and number of college personnel. The null hypothesis for HO_2,

TABLE 16

ALL VARIABLES WITH NUMBER OF USMES/TEAM ($HO:_2$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFI-CANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVER-ALL F	SIGNIFI-CANCE
1	VAR038		5.34209	.029	.41960	.17606	.17606	.41960	5.34209	.029
2	VAR037		4.22083	.051	.54708	.29929	.12323	-.30762	5.12558	.014
3	VAR036		3.45375	.076	.62512	.39078	.09148	.14257	4.91766	.009
4	VAR027		3.35668	.081	.68660	.47142	.08065	.05945	4.90533	.006
5	VAR031		3.14494	.091	.73503	.54027	.06885	.33517	4.93586	.004
6	VAR008		3.48620	.077	.78007	.60851	.06824	.00307	5.18122	.002

VAR038 ROLE OF TEAM LEADER

VAR037 LIMITATIONS ON IMPLEMENTATION

VAR036 MEAN DIFFERENCE: ACTUAL-IDEAL DIFFUSION ACTIVITIES

VAR027 PRE-RTW, AUTHORITY TO IMPLEMENT USMES

VAR031 ORGANIZATIONAL HEALTH

VAR008 NUMBER OF COLLEGE PERSONNEL

$$Y\ (HO:_2) = -30.63 + 10.00\ (VAR038) - .15\ (VAR037) + .76\ (VAR036) + 2.7\ (VAR027) + .24\ (VAR031) - 2.40\ (VAR008)$$

is therefore rejected on the basis of the relationship of these six independent variables.

It is worthwhile to note the inclusion of two variables into the regression statement which are only slightly correlated to the dependent variable. These suppressor variables apparently add a significant amount to the predictor variable immediately preceeding their inclusion (steps 4 and 6). Hypothesis HO_2 is therefore rejected.

Five of the six variables are positively related, indicating that as they increase so did the dependent variable, number of USMES units taught/team. Limitations on implementation was negatively related.

DEPENDENT VARIABLE - Level of Diffusion of the USMES Program/Team

The third dependent variable examined in this study explored the relationship among the independent variables to the number of diffusion activities engaged in by each Resource Team. Included in the assessment of the level of diffusion/team are such activities as: informational meetings, workshops, publicity, and college/university activities.

PEARSON'S CORRELATION: Number of Diffusion Activities/Team

NULL HYPOTHESIS:

THERE IS NO LINEAR RELATIONSHIP BETWEEN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF DIFFUSION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF DIFFUSION ACTIVITIES HELD BY EACH USMES RESOURCE TEAMS).

There are five (5) significantly ($p \leq .10$) correlated variables thus supporting the rejection of this hypothesis. Table 17 shows the correlational values of those variables meeting the criterion of acceptance.

TABLE 17

PEARSON'S CORRELATION: ALL VARIABLES WITH NUMBER OF DIFFUSION ACTIVITIES/TEAM

Variable	Pearson's r
Size of Team	.4715*
Number of School Systems/Team	.4278*
Post-RTW, Appeal of USMES	-.4811*
Post-RTW, Value of RTW	-.4035*
April (1976) Value of Working on Implementation Plan	.4228*

(*$p \leq .10$)

The data reported in Table 17 seems somewhat confusing in that Post-RTW, Appeal of USMES and Post-RTW, Value of RTW are inversely related to the level of diffusion. This apparent discrepency is perhaps best explained by the relationship between size of team and these two variables, which correlate -.7727 and -.9051, respectively. Since they correlate so highly with size of team it follows that they will also relate to the dependent measure in much the same

manner as does, size of team.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS - HO_{3-1}

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE DEMOGRAPHIC INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF DIFFUSION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF DIFFUSION ACTIVITIES HELD BY EACH USMES RESOURCE TEAM).

There were two significantly correlated ($p \leq .10$) variables, size of team and number of schools systems/team, from the demographic independent variable cluster. The analysis of these variables by stepwise multiple linear regression did not identify any additive relationship among these variables. Although, size of team and number of school systems/team, are significantly correlated when considered independently, their intercorrelation ($r = .3696$) is sufficiently strong to prevent any additive predictive relationship. Table 18 provides a summary statement of this analysis. Null hypothesis $HO:_{3-1}$ is therefore not rejected.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS - $HO:_{3-2}$

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLE IDENTIFIED IN THE RTW INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF DIFFUSION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF IDFFUSION ACTIVITIES HELD BY EACH USMES RESOURCE TEAM).

TABLE 18

DEMOGRAPHIC CLUSTER WITH LEVEL OF DIFFUSION/TEAM ($HO:_{3-1}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR004		7.14639	.013	.47150	.22231	.22231	.47150	7.14639	.013

VAR004 SIZE OF TEAM

The Pearson's product-moment procedure identified three significantly correlated variables (see Table 17) from the RTW independent variable cluster. These variables are: post-RTW, appeal of USMES; post-RTW, value of RTW, and April (1976), value of team meetings at RTW. The analysis of these variables (RTW cluster) by multiple linear regression indicates that five (5) variables account for 71 per cent of the variance of the dependent variable, number of diffusion activities per team. Null hypothesis $HO:_{3-2}$ is therefore rejected. Table 19 provides a summary of this regression equation.

Post-RTW, appeal of USMES, Post-RTW, value of working on USMES units at RTW; and Pre-RTW, satisfaction with team members were inversely related to the level of diffusion/team. April, value of team meetings at RTW and April, appeal of USMES were directly related to increasing levels of diffusion activities per team.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: $HO:_{3-3}$

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE SET OF VARIABLES IDENTIFIED IN THE ORGANIZATIONAL FACTOR INDEPENDENT VARIABLE CLUSTER AND THE LEVEL OF DIFFUSION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF DIFFUSION ACTIVITIES HELD BY EACH USMES RESOURCE TEAM).

Utilization of the Pearson product-moment procedure produced the correlation coefficients between the independent variables in the organizational cluster and the dependent measure, number of diffusion activities, which is presented in

TABLE 19

RTW CLUSTER WITH LEVEL OF DIFFUSION/TEAM ($HO:_{3-2}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR013		7.53074	.001	.48114	.23150	.23150	-.48114	7.53074	.011
2	VAR026		15.84656	.001	.73289	.53712	.30563	.42275	13.92476	.001
3	VAR019		4.82390	.034	.78573	.61737	.08025	-.04110	12.37022	.001
4	VAR023		3.59267	.071	.81920	.67109	.05371	-.30764	11.22166	.001
5	VAR014		3.01685	.097	.84404	.71240	.04132	.00368	10.40369	.001

VAR013 POST-RTW, APPEAL OF USMES

VAR026 APRIL, VALUE OF TEAM MEETINGS AT RTW

VAR019 POST-RTW, VALUE OF WORKING ON USMES UNITS AT RTW

VAR023 PRE-RTW SATISFACTION WITH TEAM MEMBERS

VAR014 APRIL, APPEAL OF USMES

$Y\ HO:_{3-2} = 56.26 - .97\ (VAR013) + 11.28\ (VAR026) - 4.95\ (VAR019) - 3.05\ (VAR023) - .49\ (VAR014)$

Table 17. Only one variable, value of RTW team meetings (April, 1976), was found to be correlated to the number of diffusion activities/team ($r=.4228$, $p \leq .008$).

Analysis of this data by multiple linear regression produced a regression statement which accounts for 40 per cent of the variance ($p \leq .008$) when using the following three independent variables: (1) April, Value of Team Meetings at RTW, (2) Post-RTW Authority to Implement USMES, and (3) Mean Difference Actual-Ideal Instructional Activities. April, value of team meetings at RTW was directly related to increasing levels of diffusion/team while; Post-RTW, authority to implement USMES and higher descrepencies between actual/ideal level of USMES instructional were found to be inversely related. Null hypothesis, $HO:_{3-3}$ is therefore rejected. Table 20 provides a complete summary.

MULTIPLE LINEAR REGRESSION

NULL HYPOTHESIS: $HO:_3$

THERE IS NO MULTIPLE LINEAR RELATIONSHIP BETWEEN THE UNIVERSAL SET OF INDEPENDENT VARIABLES AND THE LEVEL OF DIFFUSION OF THE USMES PROGRAM (AS MEASURED BY THE NUMBER OF DIFFUSION ACTIVITIES HELD BY EACH USMES RESOURCE TEAM).

As indicated in Table 20 there are five (5) variables from the universal set of independent variables which correlate with the number of diffusion activities per team. Analysis by stepwise multiple linear regression (universal set of variables) produced a regression equation which accounts for

TABLE 20

ORGANIZATIONAL CLUSTER WITH LEVEL OF DIFFUSION/TEAM ($HO:_{3-3}$)

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR026		5.44029	.028	.42275	.17872	.17872	.42275	5.44029	.028
2	VAR028		3.98416	.057	.54373	.29565	.11693	-.15351	5.03692	.015
3	VAR034		3.77724	.064	.62849	.39500	.09936	-.26691	5.00560	.008

VAR026 APRIL, VALUE OF TEAM MEETINGS AT RTW

VAR028 POST-RTW, AUTHORITY TO IMPLEMENT USMES

VAR034 MEAN DIFFERENCE: ACTUAL-IDEAL INSTRUCTIONAL ACTIVITIES

$$Y\ HO:_{3-3} = 13.62 + 7.23\ (VAR026) - 5.19\ (VAR028) - .79\ (VAR034)$$

59 per cent of the variance Null hypothesis, $HO:_3$, is therefore rejected. Table 21 provides a summary of the regression steps and the regression equation.

The variables: size of team, April, value of team meetings at RTW; and April, appeal of USMES were all positively related. Increases in any of these variables was related to increased levels of diffusion activities/team. Post-RTW, value of working on USMES units at RTW was found to be negatively related, indicating that higher team approval of this RTW activity corresponded to lower rates of USMES diffusion.

Summary of Null Hypotheses

There were three (3) major multiple linear regression hypotheses tested in this investigation with each major hypothesis broken down into three sub-hypotheses for a total of twelve (12) multiple linear regression null hypotheses. The three primary hypotheses were concerned with the level of implementation of the USMES program (mean hrs/wk of USMES/Team and number of USMES units/team) and level of diffusion of the USMES program (number of diffusion activities/team).

In addition to these hypotheses, the results of three hypotheses examining single-order relationships between the independent and dependent variables, have been described. The independent variables were clustered into three groups; demographic, Resource Team Workshop, and organizational factors for means of analysis by multiple regression. All variables

TABLE 21

ALL VARIABLES WITH LEVEL OF DIFFUSION/TEAM ($HO:_3$)

STEP	VARIABLE ENTERED	F TO ENTER	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VAR004	7.14639	.013	.47150	.22231	.22231	.47154	7.14639	.013
2	VAR026	8.09083	.009	.64682	.41838	.19607	.42275	8.63209	.001
3	VAR014	4.39871	.047	.71537	.51176	.09338	.00368	8.03590	.001
4	VAR019	4.31776	.050	.76932	.59186	.08010	-.04110	7.97575	.001

VAR004 SIZE OF TEAM

VAR026 APRIL, VALUE OF TEAM MEETINGS AT RTW

VAR014 APRIL, APPEAL OF USMES

VAR019 POST-RTW, VALUE OF WORKING ON USMES UNITS AT RTW

$$Y\ HO:_3 = 15.91 + .34\ (VAR004) + 10.32\ (VAR026) - .70\ (VAR014) - 5.19\ (VAR019)$$

were included in the universal set of independent variables to check for interacion among members of the three clusters. Table 22 is a summary, indicating acceptance or rejection of all stepwise multiple linear regression null hypotheses tested in this study.

When examining the correlations among all of the 33 independent variables to each of the three (3) dependent variables only one independent variable, organizational health, was found which correlated highly with more than one of the dependent variables. Eleven other independent variables correlated with one of the three dependent variables. Table 23 provides a summary of all the Pearson correlations, (p .10) between independent and dependent variables. Those variables which were included as acceptable predictors in the stepwise multiple linear regression analysis are identified by plus (+) sign.

Although, not a planned part of this investigation, single-order Pearsons product-moment correlations among all independent variables as a check for inter-correlations prior to the stepwise multiple linear regression analysis. Size of team was found to be inversely (p = .10) related to seven (7) of the independent variables. Four (4) of these variables were significant and inversely related predictors of the two implementation criteria used in this study (appeal of USMES, value of RTW, value of mini-workshops at RTW, authority to implement USMES). The variable, size of team, has not only a relationship to implementation but also to several of the independent variables.

TABLE 22

SUMMARY OF MULTIPLE REGRESSIONS
ON ALL NULL HYPOTHESES

Dependent Variable / Independent Variable Cluster	Average Number of Hrs/Wk/ Team	Number of USMES Units/ Team	Number of Diffusion Activities/ Team
Demographic	$HO:_{1-1}$ Accepted	$HO:_{2-1}$ Accepted	$HO:_{3-1}$ Accepted
Resource Team Workshops	$HO:_{1-2}$ Rejected	$HO:_{2-2}$ Accepted	$HO:_{3-2}$ Rejected
Organizational Factors	$HO:_{1-3}$ Accepted	$HO:_{2-3}$ Rejected	$HO:_{3-3}$ Rejected
Universal Set of Independent Variables	$HO:_{1}$ Rejected	$HO:_{2}$ Rejected	$HO:_{3}$ Rejected

TABLE 23

SUMMARY OF PEARSON CORRELATIONS AND REGRESSION PREDICTORS BETWEEN INDEPENDENT AND DEPENDENT VARIABLES

Independent Variable	DEPENDENT VARIABLE		
	Average Number of Hours/Week per Team	Number of USMES Units per Team	Number of Diffusion Activities/ Team
Size of Team at RTW	.0472	-.0265	.4715 +
Number of College/Personnel Team	.4283 *	.0013 +	.1508
Number of Institutions/Team	-.3596 *	.1578	.1424
Number of School Systems/Team	.1785	.1745	.4278 *
Number of Schools/Team	-.3596 *	.1578	.1424
Post-RTW; Appeal of USMES	-.1775 +	.0145	-.4811 *
April, Appeal of USMES	.2658 +	.2429	.0037 +
Post-RTW, Value of RTW	.0172 +	.0170	-.4035 *
Post-RTW Value of Mini-Workshops	-.1141 +	.0955	-.2750
Post-RTW, Value of Working on USMES Units	-.1525 +	-.0802	.0411 +

TABLE 23 "continued"

Independent Variable	DEPENDENT VARIABLE: Average Number of Hours/Week per Team	Number of USMES Units per Team	Number of Diffusion Activities/ Team
Post-RTW, Value of Implementation Plan	.4495 +**	.0487	.2073
April, Value-Team Meetings at RTW	.2059	.1514	.4228 +**
Pre-RTW, Authority to Implement	-.0061	.0594 +	-.0608
Organizational Health/Team	.3942*	.3352+*	-.0260
Mean-Difference-Actual/Ideal Diffusion Activities	-.0628	.1426+	.2107
Limitations on Implementations	-.3737+	-.3076*+	-.2625
Role of Team Leader	.1565	.4196+*	.0077

1. Table 23 lists only those variables which correlated at the .10 level or lower and those variables which were identified as significant predictors by multiple linear stepwise regression analysis. Those variables marked with an asterisk, correlated at the .10 or lower those with a plus (+) sign were identified as predictors.

Chapter V

Summary And

Recommendations for Further Study

This investigation was initially conceived of as an exploration into the use of regionally-based USMES Resource Teams as mechanisms for implementation and diffusion of the USMES Program. Thirty-four (34) independent variables were examined for relationships with three (3) dependent variables (2 measures of implementation, 1 of diffusion). Twelve (12) null hypotheses were tested for multiple linear relationships with varying sets of the independent variables. Seven (7) of the null hypotheses were rejected, on the basis of having significant multiple linear relationships. All three of the major null hypotheses ($HO:_1$, $HO:_2$, and $HO:_3$) were rejected, as were four (4) of the sub-hypotheses ($HO:_{1-2}$, $HO:_{2-3}$, and $HO:_{3-3}$). (see Table 22)

Three null hypotheses were tested for linear relationships among the independent variables and the three dependent measures. The Pearson's product-moment correlation procedure was used and those data are reported in Tables 7, 12 and 17.

It is worthwhile at this point to note that the two measures of USMES implementation did not highly correlate

(r=.3231) which accounts for the lack of similarity between predictor variables within each of the respective multiple regressions reported in Chapter IV. The third dependent variable, level of diffusion of USMES/Team correlated with mean hours/week (r=.3568) and with the number of units/team (r=.0222). Thus, there appears to be only a limited relationship among any of the three dependent variables investigated in this study.

Summary-Dependent Variable ($HO:_1$) Mean Hours/Week of USMES/Team (All Variables)

The regression equation for the dependent variable, mean hours/week of USMES/Team, identified three (3) variables which accounted for 43 per cent of the variance. The variable (Post RTW, work on implementation plan at RTW) entered at Step 1 supports the literature cited in Chapter II that emphasized team planning during training sessions was positively related to future success. The second best predictor in this equation was the number of college/university personnel per team which accounts for ten (10) per cent of the variance. This finding provides continued support to the team concept in that the intent of having such personnel as members of the Resource Teams was conceived of by USMES/EDC as vital to sustained implementation.

Two other variables, organizational health and limitations on implementation, although they correlate higher with the dependent variable than some of the variables in

the regression equation (r=.3945 and r=.3747 respectively) are excluded from the stepwise multiple regression. This exclusion occurs because of their inter-correlation with the best predictor, Post-RTW value of working on implementation plan (r=.3861 and r=.3489 respectively). Although not included in the regression analysis their relationship to the dependent variable should not be overlooked.

Summary-Dependent Variable ($HO:_2$)/Number of USMES Units Taught/Team (All Variables)

As has already been noted, since the two dependent variables associated with implementation of USMES are not highly correlated, one might assume that predictor variables for one would not be important for the other. Except for, number of college personnel/team, this assumption holds true. A greater number of the independent variables from the organizational cluster were included in this regression analysis than for the first measure of implementation (mean hrs/wk of USMES/team). Six (6) predictor variables were identified as accounting for 61 per cent of the variance in the dependent variable, number of USMES units taught/team.

Surprisingly, the best predictor is, the role of team leader. Those teams, whose team leader is a college/university person, tend to have taught more USMES units (r=.4196) than teams led by a public school person. It may be that the college/university person, being in a unique relationship with the public schools as team leader, feels a special responsibility

to encourage and support team members. Teachers, may also be responding to their perceived importance and status of this type of team leader, by spending more time teaching USMES units. A third inference might be, because of the diversity of responsibilities of team leaders who are members of a school system, they do not have enough time to operate effectively as a team leader. There may also be operating the possibility that a team leader, from one school system will have limited impact on team members from another school system. Quite possibly, team members may associate expertise and influence as part of their role expectations of college/university personnel who are USMES Resource Team leaders. Many times, the same status is not accorded to school system personnel, even though training and qualifications may not differ.

The second step of this multiple regression (Table 16) added the variable, limitations on implementations. This variable, by its negative correlation (r=-.3076) implies a relationship of greater number of USMES units as the number of limitation decreases. A CROSSTABS program was used to analyze difference between teachers and non-teachers in terms of the strength of limitations. Teachers were found to view a significantly higher effect on implementation of USMES than non-teachers on the following items:

- Availability of design lab — chi square = 12.9 ($p \leq .011$)
- Amount of funds — chi square = 9.0 ($p \leq .058$)
- Time to do USMES — chi square = 11.4 ($p \leq .022$)

Non-Teachers were less positive than teachers in relation to:

Principal as source of resistance — chi square = 9.8 ($p \leq .042$)

Value of RTW — chi square = 11.3 ($p \leq .023$)

A third predictor, organizational health of team, warrants some attention since it has the potential of receiving attention during the planning and training sequences of the change strategy investigated in this study. There has been considerable interest, by many in the field of change, that the process of "team building" is an important process to deal with during the planning and training aspects for participants of educational innovations. This concept of organizational health was described in depth in Chapter II of this study and the findings here suggest that continued evaluation of this concern is warranted.

Summary-Dependent Variable ($HO:_3$)/Level of Diffusion Activities/Team (All Variables)

As described in Chapter IV (Table 21) four (4) independent variables accounted for 59 per cent of the variance of the dependent variable. When the multiple linear regression analysis was first done a multiple linear relationship among five (5) variables was found which accounted for 71 per cent of the

variance. This first regression included as the best predictor the variable; Post-RTW, Appeal of USMES (r=-.48). At the fourth step the variable Pre-RTW Satisfaction with Team Members (r=-.31) was added. Excluded from this first stepwise regression was the variable, Size of Team (r=.47). Since it is far more practical to alter the size of a team than to explain how teams with low appeal of USMES influence the number of diffusion activities per team, it was decided to remove the variable from consideration and repeat the regression analysis. The variable, Size of Team, was originally not considered because of its high correlation with Appeal of USMES (r=-.77). When the variable Appeal of USMES was excluded from the analysis, the variable Size of Team then entered the regression equation at Step 1. The results of this replacement produced a more practical set of predictor variables with the trade-off being a reduction in variance accounted for from 71 to 59 per cent. It is the belief of this investigator that this trade-off is valid and justifiable for the reasons stated above.

Recommendations for Future Study

An exploratory study, does not have as its main purpose the definitive description of the causes of events under investigation. Its function is far more basic and often overlooked, just as case study methodologies are, in favor of the perceived value and scholarly status attributed to cause-effect studies. This type of investigation seeks to identify from widely divergent literature reviews, promising factors

which may become the focus for in-depth analysis, only after sufficient relationships with the phenomenon under examination can be established. It is the belief of this investigator that only after this type of research should more highly structured and narrowly focused studies be undertaken. Just as the case studies cited in Chapters I and II led to the inclusion or exclusion of many variables within this study, the findings of this research may enable other investigators to select specific variables for study and more succinct methods of data analysis.

Based on the findings of this study the following suggestions are made for future study:

1. The independent variable, organizational health, was identified as a significant predictor for the dependent variable, number of USMES units taught/team. This finding, and the literature cited in this study, suggest that continued and detailed analysis of the effect of organizational health on implementation is warranted.

2. The variable, role of team leader, was found to be the best predictor of the number of USMES units taught per team. These data suggest that future examination of the role of a team leader might add additional understanding of the complex influences in the level of success by a resource team.

3. The size of a team variable was found to be the best predictor of the number of diffusion activities per team. This same variable was found to have a significant negative relationship to seven other independent variables. The complex effect of this variable suggests that further evaluation of the size of a resource team is necessary.

4. Two of the independent variables, number of

institutions/team and number of schools/team, were found to be inversely related to average number of hours/week USMES was taught/team, but not to the second implementation measure, number of USMES units taught/team. Since these two variables are central to the concept of regional resource teams, additional research should be carried out to clarify their relationship to implementation rates.

Although not directly generated from the findings of this study the following four (4) additional areas of future study are suggested:

1. The dependent variables used in this study as explained in Chapter III are quantitative and not qualitative measures of implementation. There is a definite need for qualitative measures of implementation which are based on student achievement of the independent outcomes.

2. A second area of future study might be a follow-up assessment of the level of implementation and diffusion of these teams after the second year of operation.

3. The method, processes, and means through which a Resource Team is formed, should be examined in greater depth. An important aspect of this area might involve the relationship between team members who represent different institutions or components of the team.

4. At the present time, no research comparing district versus regional resource teams, implementing the same program at identical times, has been carried out. Such a project would provide opportunities for both case study and quasi-experimental research designs.

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APPENDIX A

USMES Resource Team

Program, Brochure

USMES resource team program 1975

the usmes resource team program

USMES/EDC believes teachers need workshop experience and some follow-up support to use USMES effectively, but it is itself unable to provide workshop training or follow-up support for any significant number of American elementary school teachers. With the support of the National Science Foundation, however, USMES/EDC is able to provide training and workshop experience for a significant number of teams of teachers. These teams are called Resource Teams because upon completion of their workshop training, they do become resources for the institutions and areas to which they return.

USMES/EDC has held a Resource Personnel Workshop in East Lansing, MI (summer, 1973), and Resource Team Workshops in Arlington, MA (spring, 1974) and Santa Cruz, CA (summer, 1974). These latter two workshops were attended by 35 teams of school district personnel – teachers, curriculum supervisors, consultants, central office staff, and, in a few instances, university personnel. Each team was trained in the USMES style of teaching and learning, and in dissemination and implementation strategies. Each prepared an implementation plan for its own (or its collaborating) district, and each is now in the process of carrying out that plan. The dissemination and implementation strategies developed and tested by these Resource Teams will provide models for discussion and analysis during the 1975 Resource Team Workshop, as well as material for an USMES implementation manual which is currently in preparation. A list of Resource Teams is available upon request.

1975

The 1975 Resource Team Program is competitive. Priority will be given to intermediate agencies or institutions that can demonstrate a commitment to interdisciplinary curricula and real problem solving, and that can obtain school district commitments to their proposed USMES program. Roughly speaking, an "intermediate" agency is one that already has an established inservice teacher education program for several school districts or for one very large school district.

USMES/EDC's resources will enable it to train and assist approximately 30 six-person teams in 1975. Although the exact size and composition of each new Resource Team are matters for negotiation between the sponsoring agency and USMES/EDC, USMES/EDC believes that at least half of each team should be elementary school teachers who plan to use USMES themselves. Resource Teams should have no more than eight members, and no fewer than four. A six to eight member team is large enough to conduct an intensive informational and workshop program. Based on experience, we feel that teams smaller than four do not receive workshop training in enough USMES units.

commitments (1975-76 School Year)

1. USMES/EDC'S COMMITMENTS TO RESOURCE TEAMS.

In addition to conducting the summer workshop and the regional and national meetings, USMES/EDC commits itself to providing Resource Teams with the following support:

a. staff for initial inservice programs at the rate of one staff or consultant day for each 50 participant days. There are a number of university and school district personnel who have gained considerable experience as staff during USMES Resource Team and unit development workshops. USMES/EDC feels that during their initial inservice efforts, Resource Teams may wish to avail themselves of this reservoir of USMES experience both with and without the support of USMES funding.

b. one to two visits per year from a member or members of the central USMES Implementation Staff. The purpose of these visits is to receive information on the work of the team, to discuss implementation strategies, problems, and successes with team members, to provide a forum for discussions between resource team members and school district personnel, and to provide each team with detailed information on new developments in the project.

c. copies of the USMES Newsletter for each Resource Team member and each team-trained teacher.

d. a complete USMES library for team use. As new units and implementation resources become available, a copy will be sent to each team to keep its library up-to-date and complete. Video, audio and slide resource materials will be made available to teams on a loan or purchase basis.

e. subsistence and travel for one representative of the Resource Team for a regional meeting and the national meeting, and for each Resource Team Member for the summer workshop. National Science Foundation guidelines do not permit USMES/EDC to pay stipends either for workshop attendance or for classroom teaching.

f. assistance in the development of proposals for outside support of Resource Team-conducted USMES implementation.

2. COMMITMENTS BY INSTITUTIONS SPONSORING RESOURCE TEAMS TO USMES/EDC.

USMES/EDC expects sponsoring agencies to obtain letters of commitment from one or more collaborating school districts in which the districts agree to assume responsibility for:

a. release time and/or professional credits for teachers and other school personnel who attend Resource Team-conducted USMES informational meetings and USMES inservice workshops.
b. release time for Resource Team members to meet regularly and to engage in Resource team implementation and dissemination activities.
c. financial support to enable one district "demonstration" school to purchase an USMES library and Design Lab equipment and materials, and to hire a part-time Design Lab manager.

USMES/EDC also expects sponsoring agencies to submit letters of commitment in which they agree to assume responsibility for:

a. conducting USMES information meetings and USMES workshops.
b. maintaining a complete USMES library and Design Lab as part of their curriculum resource center.

USMES/EDC expects these commitments (based on study of USMES written materials, letters, phone calls, and where possible, visits with educators implementing USMES) to be made before the leader of the prospective Resource Team is invited to the Planning Conference. Because of financial restrictions USMES cannot invite representatives of uncommitted sponsoring institutions to the Planning Conference.

3. RESOURCE TEAMS' COMMITMENTS TO USMES/EDC.

a. Resource Team members must agree to meet regularly, and to help conduct USMES information meetings and inservice workshops.
b. Teaching team members must agree to try the challenge units in their classrooms that they worked on at the summer workshop. Experience has shown that students should spend at least three hours per week on the challenge in order for the classroom trial to be successful.
c. Each Resource Team must agree to meet regularly during the school year, and (for one year) submit monthly team reports, monthly Design Lab reports, and a report on each informational meeting and on each workshop. Teaching team members must agree to report on their USMES sessions. In addition, resource team members must report on their visits to Resource Team-taught USMES teachers at least once. USMES is able to pay Resource Team members at the rate of $7.14 per hour for the time they spend writing reports.

4. COMMITMENTS BY COLLABORATING SCHOOL DISTRICTS TO SPONSORING INSTITUTIONS AND TO USMES/EDC.

USMES/EDC assumes that each collaborating school district will be represented in the sponsoring institution's USMES Resource Team by at least *two* teachers from *one* elementary or middle school. Under this assumption, USMES/EDC requires collaborating school districts to make several commitments, both to USMES/EDC and to the sponsoring institution. In particular, collaborating school districts must agree to:

a. permit the Resource Team to conduct information meetings and inservice workshops for its elementary and middle school faculties,
b. provide either release time so that its elementary and middle school faculties may attend at least one Resource Team-conducted information meeting and at least one Resource Team-conducted inservice workshop, or professional credits for such attendance,
c. provide its Resource Team members release time so that they may
    a) attend regular Resource Team meetings, and
    b) take part in the Resource Team's implementation/dissemination activities, including information meetings and inservice workshops, and,
d. provide the facilities, personnel, and funds needed to make the teaching Resource Team members' elementary or middle school a "demonstration" school. That is, the collaborating school districts must agree to provide funds in sufficient amount to enable the "demonstration" school to purchase a complete USMES library and a Design Lab, to hire a part-time Design Lab Manager, and to provide the facilities required for the proper use and storage of the Design Lab equipment.

APPENDIX B

Resource Team Workshop Schedule

USMES RESOURCE TEAM WORKSHOP
June 30-July 11, 1975

WORKSHOP SCHEDULE

The workshop will be held from 9:00 a.m.-4:00 p.m., Monday-Friday. Saturday and Sunday are left free. A detailed agenda is attached. Past experience has shown that teams may need to schedule extra meetings during lunch, in late afternoon or early evening in order to fully discuss and plan their local dissemination and implementation activities.

MAJOR WORKSHOP ACTIVITIES

UNIT GROUP MEETINGS: Participants will meet in groups by unit. Each team will distribute its members among the different unit groups being offered. Groups will work on an adult version of the unit challenge. Subsequently, they will consider the kinds of investigations which might occur in classrooms and will actually work with children on the challenge. Design Lab use, math skills sessions and videotape viewing or taping will be scheduled as needed.

TEAM MEETINGS: Participants are scheduled to meet as teams to review and assess their experiences at St. Louis, and to finalize their plans for carrying out USMES implementation in their local districts. Arrangements will be made to have USMES workshop staff present to help with this planning.

MINIWORKSHOPS: Teams will conduct two USMES informational meetings similar to those they will hold in their home districts. Each team will organize and run these brief "Introduction to USMES" meetings for other workshop participants and for local teachers or university students, if possible.

PLENARY SESSIONS: General meetings will be held for all staff and participants to discuss workshops objectives, agenda, etc.

SPECIAL TOPIC MEETINGS: Sessions covering topics of concern to individual participants and/or teams (e.g., teacher training strategies, classroom management issues, USMES evaluation results, USMES in inner city schools) will be scheduled.

MEETINGS ON ADMINISTRATIVE CONCERNS: Special sessions will be held during the second week of the workshop to discuss administrative aspects of implementation.

COLLEGE/UNIVERSITY PARTICIPANTS MEETINGS: During the first week of the workshop (6/30-7/4), college and university participants will meet periodically to discuss USMES dissemination and implementation through preservice and inservice courses.

DESIGN LAB COORDINATOR TRAINING: During the second week, one member of each team will attend these sessions to gain experience in the training of Design Lab managers, in setting up labs, and in running the Design Labs at workshops, etc.

APPENDIX C

Pre-RTW Questionnaire

June 29, 1975

TO: Participants of the St. Louis, USMES Resource Team Workshop
(June 30 - July 11)

FROM: Edwin P. White, Coordinator Virginia USMES Teams

The attached questionnaire is designed to provide initial information about you and your relationship to USMES and its activities. This information and subsequent questionnaires will be used in a research project designed to evaluate the RTW as a vehicle of widespread implementation of USMES and to generate guidelines for the planning of future RTW's sponsored by USMES/EDC and other organizations.

This project is being conducted with the full support of USMES/EDC and no single individuals response to this questionnaire will be available to anyone. Collective group data will be shared with USMES/EDC Evaluative staff and persons preparing separately funded USMES RTW proposals.

Please fill in your name, team name, school/affiliation, and city, state below. Your assistance is greatly appreciated in providing this information. Please return the completed questionnaire (boxes will be found in the workshop areas) by Monday afternoon.

_____
Name (Please Print)

_____
Team

_____
School/Affiliation

_____
City/State

DESCRIPTIVE INFORMATION

Directions: Please check one answer for each of the following questions. Some questions refer only to selected individuals/educational roles and you should answer only those that fit your specific situation. If in doubt, please answer and describe concern on last page clearly indicating question number.

(4) My sex is

___ 1. Female
___ 2. Male

(5) My age is

___ 1. 26 or younger
___ 2. 27-35
___ 3. 36-44
___ 4. 45-54
___ 5. 55 or older

(6) My race is

___ 1. Caucasian
___ 2. Negro
___ 3. Indian
___ 4. Oriental
___ 5. Other (Specify)_____
_____
_____

(7) The number of people in my Resource Team

___ 1. Three
___ 2. Four
___ 3. Five
___ 4. Six
___ 5. Seven
___ 6. Eight

(8) The make-up of my Resource Team is (indicate number of each category)

___ 1. Teachers
___ 2. Principals
___ 3. Supervisors/Central Office
___ 4. College/University
___ 5. Other (Specify) _____
_____
_____

(9) The number of years teaching experience I have had is

___ 1. 0-1
___ 2. 2-5
___ 3. 6-10
___ 4. 11-20
___ 5. 21 or more

(10) My position is

___ 1. Teacher
___ 2. Principal
___ 3. Elementary Supervisor
___ 4. Subject Area Supervisor
___ 5. General Supervisor
___ 6. Director of Instruction
___ 7. Teacher Education/College
___ 8. Arts & Sciences/College
___ 9. Other (Specify)_____
_____

(11) If a teacher, I am responsible for children who are in

___ 1. Primary (K-3)
___ 2. Elementary (4-6)
___ 3. Middle School (5-8)
___ 4. Junior High (6-8)
___ 5. Other (Specify) _____
_____
_____

(12) If a teacher, my classroom is

___ 1. Self-contained
___ 2. Departmentalized by subject
___ 3. Team Teaching
___ 4. Other (Specify) _____
_____
_____

(13) I have participated in the following USMES activities before attending the St. Louis RTW (check all that apply)

___ 1. Information meeting(s) (less than 1 day)
___ 2. Workshop (1 day)
___ 3. Visit USMES classrooms
___ 4. USMES Administrators Conference (2-3 days)
___ 5. Locally sponsored training sessions (more than 1 day)
___ 6. USMES/EDC sponsored training sessions (more than 1 day)
___ 7. Informal discussions

(14) The number of children in my school system is

___ 1. 0-2,499
___ 2. 2,500-4,999
___ 3. 5,000-14,999
___ 4. 15,000-24,999
___ 5. 25,00 or more
___ 6. I don't know

(15) The number of children in my school is

___ 1. less than 100
___ 2. 101-250
___ 3. 251-500
___ 4. over 500
___ 5. I don't know

(16) How were you selected for an USMES Resource Team

___ 1. Chosen by principal
___ 2. Chosen by Supervisor/Central Office
___ 3. I requested selection
___ 4. No one else was willing
___ 5. Other (Specify) _____

(17) I agreed to participate in the USMES Team from my school/ school division with

___ 1. skepticism/reluctance
___ 2. enthusiasm/eagerness

(18) The number of children who I directly work with in USMES is

___ 1. 0
___ 2. 1-35
___ 3. 36-70
___ 4. 71-105
___ 5. 106-140
___ 6. over 140

(19) Number of hours/week you plan to use USMES this fall

___ 1. two hours or less
___ 2. two-three
___ 3. three-four
___ 4. four-five
___ 5. more than five

(20) If in a Teacher Training College/University my major responsibility is in the area of

___ 1. Science Education
___ 2. Mathematics Education
___ 3. Social Studies Education
___ 4. Language Arts Education
___ 5. Elementary Education
___ 6. Curriculum
___ 7. Administration
___ 8. Other (Specify) _____

(21) When I was (or presently am) a classroom teacher my major teaching area was (is)

___ 1. Elementary, self-contained
___ 2. Team Teaching (Units)
___ 3. Mathematics
___ 4. Science
___ 5. Language Arts
___ 6. Social Studies
___ 7. Special Education
___ 8. Secondary Teaching
  ___ Science
  ___ Math
  ___ Social Studies
  ___ Other
___ 9. Industrial Arts

(22) Which unit did you investigate during the first week of the workshop?

___ 1. Pedestrian Crossing
___ 2. Lunch Lines
___ 3. Consumer Research
___ 4. Designing for Human Proportions
___ 5. Manufacturing/Advertising
___ 6. School Zoo
___ 7. Orientation/Getting There
___ 8. Other (Specify) _____
  _____
  _____

(23) Which unit did you investigate during the second week of the workshop?

___ 1. Play Area Design and Use
___ 2. Weather Predictions
___ 3. Bicycle Transportation
___ 4. Classroom Design/Classroom Management
___ 5. Ways to Learn
___ 6. Design Lab Coordinator Training
___ 7. Other (Specify) _____
  _____
  _____

APPEAL OF USMES

Directions: Please circle the number which best indicates the appeal each of the following components of USMES has to you.

Scale:
1. No appeal
2. Little appeal
3. Some appeal
4. Considerable appeal
5. Highest appeal

(24)	Interdisciplinary Approach	1 2 3 4 5
(25)	Design Lab Activities	1 2 3 4 5
(26)	Concept of Real Problem Solving	1 2 3 4 5
(27)	Social Interaction of children	1 2 3 4 5
(28)	Activity-centeredness	1 2 3 4 5
(29)	Content acquisition	1 2 3 4 5
(30)	Desire for student decision-making	1 2 3 4 5
(31)	Development of basic skills	1 2 3 4 5
(32)	Teacher's Role as Coordinator	1 2 3 4 5
(33)	Background Papers	1 2 3 4 5
(34)	"How To" cards	1 2 3 4 5
(35)	USMES Newsletter	1 2 3 4 5
(36)	USMES Correlation Guide	1 2 3 4 5
(37)	Skill charts in Resource Books	1 2 3 4 5
(38)	Teacher Resource Books	1 2 3 4 5
(39)	Teacher Reports	1 2 3 4 5
(40)	Design Lab Manual	1 2 3 4 5
(41)	Workshop Resource Book	1 2 3 4 5
(42)	USMES Resource Guide	1 2 3 4 5

PRESENT STATUS OF YOU AND USMES

Directions: The following is a series of statements regarding your attitudes and feelings concerning you and USMES. Please respond to each item in terms of the following scale:

Scale:
1. Highly Satisfied
2. Satisfied
3. Uncertain
4. Dissatisfied
5. Highly Dissatisfied

(43) How satisfied are you that you have been given enough authority by your administration to implement and disseminate information about USMES? 1 2 3 4 5

(44) How satisfied are you with real problem-solving as a major goal of education? 1 2 3 4 5

(45) How satisfied are you with the other personnel in your Resource Team? 1 2 3 4 5

(46) How satisfied are you with the resource materials provided by USMES Central? 1 2 3 4 5

(47) How satisfied are you with USMES as compared with other instructional programs you have used? 1 2 3 4 5

(48) How satisfied are you that USMES provided for individual differences among children? 1 2 3 4 5

(49) How satisfied with the information you received about USMES and the RTW before coming to St. Louis? 1 2 3 4 5

APPENDIX D

Post-RTW Questionnaire

July 11, 1975

TO: RTW Participants

FROM: Ed White, Virginia USMES Coordinator

Please complete the attached questionnaire and return to your team leader during your team meeting today (1:00 - 2:00 p.m.). A collection box will be found in the Plenary Session (2:00 - 3:00 p.m.). Team leaders are asked to check and make sure that each member of their team has completed a questionnaire and place the completed forms in the collection box. Your assistance and time in completing this questionnaire is greatly appreciated and will be of considerable value to the USMES Project and other participants.

_____
Name (Please Print)

_____
Team

_____
School/Affiliation

_____
City, State

APPEAL OF USMES

Directions: Please circle the number which best indicates the appeal each of the following components of USMES has to you.

Scale:
1. No appeal
2. Little appeal
3. Some appeal
4. Considerable appeal
5. Highest appeal

(24)	Interdisciplinary Approach	1 2 3 4 5
(25)	Design Lab Activities	1 2 3 4 5
(26)	Concept of Real Problem Solving	1 2 3 4 5
(27)	Social Interaction of children	1 2 3 4 5
(28)	Activity-centeredness	1 2 3 4 5
(29)	Content acquisition	1 2 3 4 5
(30)	Desire for student decision-making	1 2 3 4 5
(31)	Development of basic skills	1 2 3 4 5
(32)	Teacher's Role as Coordinator	1 2 3 4 5
(33)	Background Papers	1 2 3 4 5
(34)	"How To" cards	1 2 3 4 5
(35)	USMES Newsletter	1 2 3 4 5
(36)	USMES Correlation Guide	1 2 3 4 5
(37)	Skill charts in Resource Books	1 2 3 4 5
(38)	Teacher Resource Books	1 2 3 4 5
(39)	Teacher Reports	1 2 3 4 5
(40)	Design Lab Manual	1 2 3 4 5
(41)	Workshop Resource Book	1 2 3 4 5
(42)	USMES Resource Guide	1 2 3 4 5

PRESENT STATUS OF YOU AND USMES

Directions: The following is a series of statements regarding your attitudes and feelings concerning you and USMES. Please respond to each item in terms of the following scale:

Scale:
1. Highly Satisfied
2. Satisfied
3. Uncertain
4. Dissatisfied
5. Highly Dissatisfied

(43) How satisfied are you that you have been given enough authority by your administration to implement and disseminate information about USMES? 1 2 3 4 5

(44) How satisfied are you with real problem-solving as a major goal of education? 1 2 3 4 5

(45) How satisfied are you with the other personnel in your Resource Team? 1 2 3 4 5

(46) How satisfied are you with the resource materials provided by USMES Central? 1 2 3 4 5

(47) How satisfied are you with USMES as compared with other instructional programs you have used? 1 2 3 4 5

(48) How satisfied are you that USMES provided for individual differences among children? 1 2 3 4 5

(49) How satisfied with the information you received about USMES and the RTW before coming to St. Louis? 1 2 3 4 5

RESOURCE TRAINING WORKSHOP

Directions: Please circle the number which best indicates the degree to which you believe each of the following activities/experiences contributed to your effective understanding of USMES, provided during the St. Louis RTW.

Scale:
1. No Value
2. Little Value
3. Some Value
4. Quite Valuable
5. Very Valuable

(50)	Work on USMES challenges	1 2 3 4 5
(51)	Construction of items in Design Lab	1 2 3 4 5
(52)	Content area skill sessions	1 2 3 4 5
(53)	Interaction with Content-Curriculum Specialist	1 2 3 4 5
(54)	Viewing video tapes	1 2 3 4 5
(55)	Presentation of mini-workshop	1 2 3 4 5
(56)	Design Lab skill sessions	1 2 3 4 5
(57)	Development of "back-home" implementation plans	1 2 3 4 5
(58)	Informal participant discussions	1 2 3 4 5
(59)	Viewing of "Design Lab" Slide-Tape show	1 2 3 4 5
(60)	Working with children on challenge	1 2 3 4 5
(61)	Interaction with USMES classroom teacher (staff)	1 2 3 4 5
(62)	Plenary sessions	1 2 3 4 5
(63)	Interaction with USMES Central staff	1 2 3 4 5
(64)	Discussions with other Resource Team personnel	1 2 3 4 5
(65)	Use of "How to" cards	1 2 3 4 5
(66)	Viewing of USMES "General" Slide-Tape Show	1 2 3 4 5
(67)	Participate in Team Meetings	1 2 3 4 5
(68)	Social activities scheduled	1 2 3 4 5
(69)	Interaction with teachers on grade level use of USMES	1 2 3 4 5

APPENDIX E

April, 1976 Questionnaire

April 15, 1976

TO: All 1975-76 Regional USMES Resource Team Members

FROM: Edwin White, Director 1975 Resource Team Study
Earle Lomon, USMES Project Director

Attached is the final questionnaire of the research study, directed by Edwin P. White, on the 1975 Regional USMES Resource Teams. The data collected previously has been very valuable but its potential for aiding in the formation of future teams and the operation of future Resource Team Workshops cannot be fully realized without your continued support. Please complete this questionnaire as soon as possible and return it in the enclosed self-addressed, stamped envelope. Before placing your questionnaire in the return envelope, please tear off this page and check to make sure you have completed the name, team name, and school spaces on the first page of the questionnaire.

Your assistance in this research study is greatly appreciated. It is planned that a report of the results of this effort will be distributed through the USMES NEWSLETTER and directly to all Team Leaders this summer.

Note: Your questionnaire should be mailed directly to Edwin White, State Department of Education, Copeley Hill, 27-B28, Charlottesville, Virginia 22903, and not to the USMES Project. Your responses are considered to be confidential and reports of questionnaire results to USMES Central Staff and to other teams will respect this confidentially.

Regional

USMES Resource Team

Questionnaire

Name _____ Date _____

Team Name _____ School _____

USE OF USMES

(only teachers need complete)
question I & II

I. Indicate the number of hours/week you teach USMES. _____

II. Number of USMES units you will have completed by June, 1976.

_____

(e.g. taught Consumer Research 3 times, Soft Drink Design 2 times, and Bicycle Transportation once: total - 6 USMES Units

APPEAL OF USMES

Directions: Please circle the number which best indicates the appeal each of the following components of USMES has to you.

1	2	3	4	5
No Appeal				High Appeal

1.	Interdisciplinary Approach	1 2 3 4 5
2.	Design Lab Activities	1 2 3 4 5
3.	Concept of Real Problem Solving	1 2 3 4 5
4.	Social Interaction of children	1 2 3 4 5
5.	Activity-centeredness	1 2 3 4 5
6.	Content Acquisition	1 2 3 4 5
7.	Desire for student decision-making	1 2 3 4 5
8.	Development of basic skills	1 2 3 4 5
9.	Teacher's Role as Coordinator	1 2 3 4 5

Limitations on USMES Implementation

Directions: Please circle the number which best indicates the degree to which you feel the following items "slowed you down" or restricted you from carrying out implementation of USMES in your school.

Scale: 1 2 3 4 5
Very restricting — Not restricting

1.	Availability of Design Lab	1 2 3 4 5
2.	Supervisory support for USMES	1 2 3 4 5
3.	Planning time for USMES	1 2 3 4 5
4.	Amount of funds allocated for Implementation of USMES	1 2 3 4 5
5.	Resistance to USMES by other teachers	1 2 3 4 5
6.	Resistance to USMES by other principals	1 2 3 4 5
7.	Resistance to USMES by other parents/community	1 2 3 4 5
8.	Time to do USMES in regular school day	1 2 3 4 5
9.	Administrative policies (school or school division)	1 2 3 4 5
10.	Interpersonnel communications between team members	1 2 3 4 5
11.	Personal commitment to USMES	1 2 3 4 5
12.	Your training at the Resource Team Workshop	1 2 3 4 5
13.	Support from Team members	1 2 3 4 5
14.	Material resources from USMES Central (Teacher Resource Books, etc)	1 2 3 4 5
15.	USMES Central Support (Newsletter, visits, special reports)	1 2 3 4 5
16.	Planning and presenting USMES Informationals/ Workshops	1 2 3 4 5

PRESENT STATUS OF YOU AND USMES

Directions: The following is a series of statements regarding your attitudes and feelings concerning you and USMES. Please respond to each item in terms of the following scale:

Scale: 1 (Highly Dissatisfied) 2 3 4 5 (Highly Satisfied)

(27)	How satisfied are you that you have been given enough authority by your administration to implement and disseminate information about USMES?	1	2	3	4	5
(28)	How satisfied are you with real problem-solving as a major goal of education?	1	2	3	4	5
(29)	How satisfied are you with the other personnel in your Resource Team?	1	2	3	4	5
(30)	How satisfied are you with the resource materials provided by USMES Central?	1	2	3	4	5
(31)	How satisfied are you with USMES as compared with other instructional programs you have used?	1	2	3	4	5

RESOURCE TRAINING WORKSHOP

Directions: Please circle the number which best indicates the degree to which you believe each of the following activities/experiences, provided during the St. Louis RTW, contributed to your effective understanding of USMES.

Scale: 1 (No Value) 2 3 4 5 (High Value)

(32)	Work on USMES challenges	1	2	3	4	5
(33)	Content area skill sessions	1	2	3	4	5
(34)	Interaction with Content-Curriculum Specialist	1	2	3	4	5
(35)	Presentation of mini-workshop(s)	1	2	3	4	5
(36)	Design Lab skill session	1	2	3	4	5
(37)	Development of "back-home" implementation plans	1	2	3	4	5
(38)	Informal participant discussions	1	2	3	4	5
(39)	Working with children on challenge	1	2	3	4	5
(40)	Interaction with USMES classroom teacher (staff)	1	2	3	4	5
(41)	Participation in Team Meetings	1	2	3	4	5
(42)	Interaction with teachers on grade level use of USMES	1	2	3	4	5

INSTRUCTIONAL AND DISSEMINATION ACTIVITIES

Directions: USMES personnel engage in many activities. Please circle the number on the left which best indicates the frequency with which you perform the following activities (actual), and the number on the right which best indicates the frequency with which you would prefer to perform those activities (ideal). If you are a non-teaching member of the team, do not answer questions.

Scale: 1 2 3 4 5

Never Frequently

How Often Do You Engage in These Activities? (Actual)			How Often Would You Prefer to Engage in These Activites? (Ideal)
(43)	1 2 3 4 5	Work with students on USMES	1 2 3 4 5
(44)	1 2 3 4 5	Work with small groups of students on USMES	1 2 3 4 5
(45)	1 2 3 4 5	Provide time for Design Lab work	1 2 3 4 5
(46)	1 2 3 4 5	Hold content area skill sessions	1 2 3 4 5
(47)	1 2 3 4 5	Hold Design Lab skill sessions	1 2 3 4 5
(48)	1 2 3 4 5	Correlate USMES activities with other areas of the curriculum	1 2 3 4 5
(49)	1 2 3 4 5	Read USMES informational materials	1 2 3 4 5
(50)	1 2 3 4 5	Utilize the USMES Background Papers	1 2 3 4 5
(51)	1 2 3 4 5	Direct children to the "How to" cards	1 2 3 4 5
(52)	1 2 3 4 5	Supervise children in Design Lab	1 2 3 4 5
(53)	1 2 3 4 5	Scrounge for materials used in Design Lab	1 2 3 4 5
(54)	1 2 3 4 5	Participate in USMES Team Meetings	1 2 3 4 5
(55)	1 2 3 4 5	Talk to other teachers about USMES	1 2 3 4 5
(56)	1 2 3 4 5	Talk to community/parents about USMES	1 2 3 4 5
(57)	1 2 3 4 5	Talk to principals/supervisors about USMES	1 2 3 4 5
(58)	1 2 3 4 5	Plan and give USMES Informationals	1 2 3 4 5
(59)	1 2 3 4 5	Train other teachers to use USMES	1 2 3 4 5
(60)	1 2 3 4 5	Arrange for classroom visitations	1 2 3 4 5

Organizational Health

The following items relate to your perception of the organizational health of your USMES team. Please circle the appropriate number in the right hand column, for each statement indicating to what degree your team is described by that statement.

SCALE

1 2 3 4 5
Low High

TO WHAT DEGREE DO YOU BELIEVE THAT:

1. . . .the team's goals of implementation/dissemination about USMES are achievable by your team? 1 2 3 4 5
2. ...the Resource Team is an appropriate mechanism for implementing/disseminating USMES? 1 2 3 4 5
3. ...there is adequate communication among team members? 1 2 3 4 5
4. ...there is adequate communication between the team and other school personnel? 1 2 3 4 5
5. ...the distribution of influence among team members is shared equally? 1 2 3 4 5
6. ...all team members value the autonomy of each individual while still recognizing the interdependence of the group as a whole? 1 2 3 4 5
7. ...the team is able to change or select new strategies for implementation/dissemination consistent with the demands of the larger system of which the team is a part? 1 2 3 4 5
8. ...the team is utilizing all of the potential strengths of its membership towards goal achievement? 1 2 3 4 5
9. ...the team members enjoy working together as a unit? 1 2 3 4 5
10. ...the team is able to cope with new, unanticipated problems with a minimum of energy lost to other team activities? 1 2 3 4 5
11. ...the strategies your team has utilized in implementing/disseminating USMES are innovative? 1 2 3 4 5
12. ...the team is effectively utilizing the resources, made available through the local school districts, in implementation/dissemination of USMES? 1 2 3 4 5
13. ...the team will continue to function next year? 1 2 3 4 5
14. ...the team feels that the USMES approach to teaching-learning is important? 1 2 3 4 5
15. ...the team members derive satisfaction, well-being and personal fulfillment from team membership? 1 2 3 4 5

APPENDIX F

Diffusion Activities Questionnaire

Team Summary
of
Implementation/Diffusion Activities
of Regional USMES Resource Teams
(1975-1976)

1. How many USMES Informational Meetings (goal-exposure to USMES) were held by your team, within Resource Team member's school districts, during 1975-1976? _____

2. How many USMES Workshops (goal-training other personnel to use USMES) were held by your team, within Resource Team member's school districts, during 1975-1976? _____

3. How many USMES Informationals (goal-exposure to USMES) were held by your team, but NOT within member's school districts, during 1975-76? _____

4. How many USMES Workshops (goal-training in using USMES) were held by your team, but NOT within team member's school districts, during 1975-76?
_____

5. How much publicity has your team received? (indicate number of times)

School District Newsletter _____
Articles in journals _____
Newspaper accounts _____
TV or Radio coverage _____
Other (specifiy) _____
_____ _____

6. How many times has USMES been included in pre-service or in-service courses by colleges/universities, included in your team, or as a response to efforts by your team? _____

7. Number of team meetings held prior to the St. Louis RTW? _____

8. Number of Resource Team meetings held since the end of RTW and the end of school year 1975-76? _____

9. How many people have become active Resource Team members, but were not team members last July? _____

10. How many members are in your Resource Team? _____

11. How many are classroom teachers? _____

APPENDIX G

Rating Form For

Team Proposals

To USMES Project

RATING FORM FOR TEAM PROPOSALS

TYPE OF CRITERIA \ NAME OF TEAM	Davis/San Juan	Los Angeles	San Jose	Colorado	Miami	Atlanta	Illinois	Louisiana	Maine	Mississippi	Nevada	Brooklyn	Staten Island	Buffalo	Long Island	Northern N. Y.	Putnam N. Westchester	Oregon	Philadelphia	Rhode Island	Austin	Houston	Utah	Vermont	Blue Ridge	Eastern Virginia	Washington	Wisconsin
RELEASE TIME																											
FINANCIAL SUPPORT Design lab materials Design lab-staff USMES library																											
PERMISSION TO CONDUCT DISSEMINATION ACTIVITIES																											
IMPLEMENTATION OF USMES STATED 3hrs/wk.																											
SUBMIT REPORTS																											
TOTAL SCORE																											

APPENDIX H

Rating Form for Team Implementation Plan

TYPE OF CRITERIA	TEAM Davis/San Juan Los Angeles San Jose Colorado Miami Atlanta Illinois Louisiana Maine Mississippi Nevada Brooklyn Staten Island Buffalo Long Island Northern N.Y. Putnam/N. Westchester Oregon Rhode Island Austin Houston Utah Vermont Blue Ridge Eastern Virginia Washington Wisconsin
Names of Institutions included in Plan	
Coordination-Implementation Who will do what Team meetings Liaisons-district Funding Reward mechanisms	
Dissemination activities How many When For Whom/By Whom	
Inservice Plans Workshops College courses Staffing	
Implementation Plan Who will teach Design Lab Materials Staff-design Lab	
TOTAL SCORE	

RATING FORM FOR TEAM IMPLEMENTATION/DIFFUSION PLAN

APPENDIX I

Guidelines for Report Writing

GUIDELINES FOR REPORT WRITING AT
USMES REGIONAL RESOURCE TEAM WORKSHOP

June 30-July 11, 1975

1. Report on Plan for Regional Implementation Program

In order to better coordinate our resource team program, we are asking each team to write up their overall plan for their regional implementation program while they are at this workshop and to turn in a copy before they leave.

The guidelines listed below indicate the kinds of information to include in your report. The report need not be lengthy or detailed, but please include some information for each section.

A. Team Institutions, districts represented on team components

B. Plans for coordinating overall implementation program

Team responsibilities--How will responsibilities for different aspects of the overall program be divided? Who will do what?
Team meetings--How many, when, where?
Liaison with district administration and schools--How will this be maintained? What person(s) are authorized to provide funding for workshop expenses, Design Labs, etc., to provide release time for team members and participating teachers for inservice workshops, meetings, etc., to facilitate ordering supplies for Design Labs, etc.? What arrangements need to be made for such things?

C. Plans for dissemination within region

Informational meetings--How many, when, where, for whom, by whom?

D. Plans for inservice teacher education

Workshops--How many, when, where, for which teachers? Will participants receive stipends, release time, other incentive or compensation? Which units will be offered and which team members will be involved in conducting the workshops?
College courses--When, where, for which teachers, staffing arrangements?

E. Plans for implementation in schools

Districts and schools involved--How many of each and what are their names? How many teachers do you expect to be involved in each? Which schools will have Design Labs? What arrangements will be made for supplying and staffing the Design Labs? How will Design Lab managers be trained?

APPENDIX J

Principal's Questionnaire

Principals' Questionnaire
on
Implementation of USMES

Name of USMES Resource Team _____

Name of School _____

Name of Principal _____ Date _____

Directions: Please complete and return this report from as soon as possible in the self-addressed stamped envelope.

1. Number of full-time equivalent teachers on your staff (do not include specialists, e.g. speech thearpist)? _____

2. Number of USMES Resource Team members in your school? _____

3. Number of teaching staff who have taught at least one USMES unit (include team members)? _____

4. Amounts of funds provided by your school to implement USMES (instructional materials only)? _____

5. Amount of funds provided for capital outlay expenses? _____

6. Amount of money provided for travel, substitutes, or teacher materials for the USMES team members? _____

7. If any new personnel were hired for use in the USMES program, indicate cost? _____

8. Indicate the number of hours/week you devoted to the USMES program.
_____

9. How has the Design Lab been staffed in your school?

Teachers _____ Paid aides _____
Principal/Asst. Principal _____ Full time manager _____
Parents/volunteers _____ Other _____
_____